



December 14, 2018

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The Honorable Chair and Members of the
Hawai'i Public Utilities Commission
465 South King Street, First Floor
Kekuanaoa Building
Honolulu, Hawai'i 96813

PUBLIC UTILITIES
COMMISSION

Dear Commissioners:

Subject: Docket No. 2018-0165
Instituting a Proceeding to Investigate Integrated Grid Planning
Hawaiian Electric Companies' Integrated Grid Planning Workplan

In accordance with Ordering Paragraph No. 7¹ of Order No. 35569, issued July 12, 2018, in the above-referenced proceeding, the Hawaiian Electric Companies² respectfully submit their Integrated Grid Planning ("IGP") Workplan.

The IGP Workplan is also available to the public on Hawaiian Electric's website at www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning.

Sincerely,

Kevin M. Katsura
Director
Regulatory Non-Rate Proceedings

Enclosure

c: Service List

¹ Ordering Paragraph No. 7 of Order No. 35569 states: "On or before December 14, 2018, the HECO Companies shall file their IGP Workplan in this docket."

² Hawaiian Electric Company, Inc. ("Hawaiian Electric"), Hawai'i Electric Light Company, Inc., and Maui Electric Company, Limited are collectively referred to as the "Hawaiian Electric Companies".



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Planning Hawai'i's Grid for Future Generations

Integrated Grid Planning Workplan

DECEMBER 14, 2018



Preface

The Hawaiian Electric Companies respectfully submit this Integrated Grid Planning Workplan in accordance with Order No. 35569 issued by the Hawai'i Public Utilities Commission on July 12, 2018 in Docket 2018-0165.



Hawaiian Electric
Maui Electric
Hawai'i Electric Light

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I Introduction

The Hawaiian Electric Companies (the “Companies”) filed the Integrated Grid Planning (“IGP”) Report on March 1, 2018¹ which proposed a fully integrated planning and procurement process.

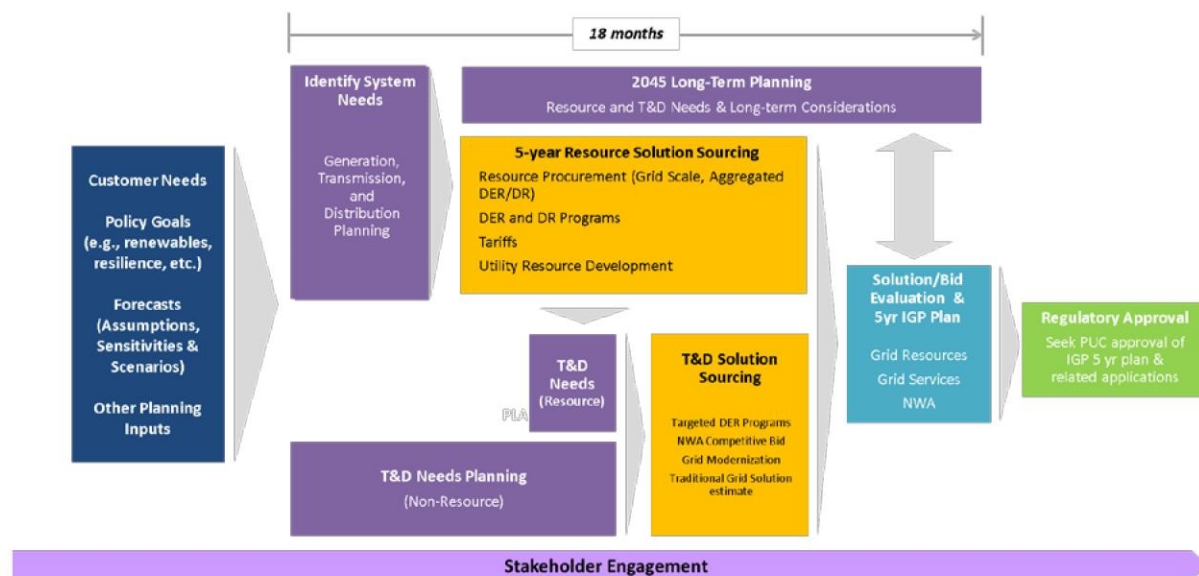


Figure 1: Integrated Grid Planning Process

The IGP is rooted in customer and stakeholder input and is intended to create customer value by harmonizing resource, transmission, and distribution planning processes by evaluating the collective identified system needs and coordinating solutions that provide the best value on a consolidated basis. This approach appraises the total needs of the system, considers all alternatives (from customers, independent providers and the utility), then selects the lowest cost/best fit solution(s) to produce an optimized portfolio to reliably and affordably operate the grid with the desired level of resilience.

¹ Docket No. 2014-0183, Instituting a Proceeding to Review the Power Supply Improvement Plans for Hawaiian Electric Company, Inc., Hawai'i Electric Light Company, Inc., and Maui Electric Company, Limited ("PSIP"), Decision and Order No. 34696, issued on July 14, 2017 ("PSIP D&O"). Subsequently, on July 13, 2018 the Companies filed the IGP Report in accordance with Order No. 35569 *Instituting a Proceeding to Investigate Integrated Grid Planning*, issued July 12, 2018 in Docket No. 2018-0165.

In developing the IGP process, the Companies recognized that it is essential to integrate market-based solutions and any integration-related considerations into the planning analysis to determine the best resource and grid options for customers. The proposed IGP process is a significant change over traditional energy planning practices, through streamlining traditionally disparate and serial tasks, related to planning and procurement into a unified process. For instance, the proposed process aims to establish a marketplace for grid solutions that is tightly integrated into the optimization and decision-making process, therefore increasing the number of opportunities for developers and aggregators of distributed energy resources (“DER²”), and grid-scale resources (e.g., Independent Power Producers (“IPP”)) to provide energy and grid services.

The Companies believe that the success of the IGP process is dependent on maintaining transparency through active stakeholder engagement. The IGP Report described the IGP Stakeholder Engagement Model which includes broad public engagement, individual stakeholder engagement, formation of a Stakeholder Council (“SC”), and the formation of Working Groups (“WG”) as needed.

The Public Utilities Commission (“Commission”) supported this advancement in system planning in its Order No. 35569:

The [C]ommission supports an integrated planning approach that coordinates and informs planning across all levels of the power system (resource, transmission, and distribution), and that ensures safe, affordable, and reliable service to customers. The holistic approach to system planning described in the IGP Report presents a methodology to develop optimized resource and grid solutions, enable the most cost-effective portfolio to be selected, and facilitate the State's transition to 100 percent renewable energy.³

The Commission also acknowledged the significant challenges in developing a comprehensive, integrated resource, transmission and distribution planning process and the need to further develop the related processes, methods and tools. In this context, the Commission directed the Companies to develop an IGP Workplan (“Workplan”) to supplement the IGP Report that further details, “the major steps or components of the IGP process, including proposed objectives, timelines, and milestones for each step,” while incorporating customer and stakeholder feedback. More specifically, the IGP Workplan is intended to address at minimum the following:

- (1) the proposed Working Groups, including their specific objectives, composition, expected deliverables, and timelines for those deliverables;

² Distributed energy resources include energy efficiency, controllable loads, renewable distributed generation, distributed energy storage, and managed electric vehicles.

³ Docket No. 2018-0165, Order No. 35569, issued on July 12, 2018, at 19.

- (2) a specific proposal for how forecasting assumptions, system data, modeling inputs, studies, analyses, meeting summaries, and other data will be shared with the commission and stakeholders throughout the IGP process;
- (3) the process and timeline for defining and quantifying grid needs (including generation, transmission, and distribution);
- (4) the process and timeline for sourcing and procuring solutions to meet identified grid needs;
- (5) the process and timeline for analysis for optimization of the grid solutions identified in the procurement phase;
- (6) opportunities for midstream evaluation and potential course correction for the IGP process; and
- (7) when and how independent facilitation will assist the IGP process.

This IGP Workplan provides, as requested, the additional detail and descriptions of timing and scope of major activities that will occur in the planning processes expected to begin in year 2020 as well as the prerequisite development activities that have already begun. The Workplan incorporates customer and stakeholder feedback received in this docket as well as directly through the public workshop held September 25, 2018 and two IGP Stakeholder Council meetings held to-date.

2 Summary of Stakeholder and Public Feedback

Stakeholder and public comments on the IGP Report were received through formal comments filed with the Commission by October 15, 2018 and through discussions with the Stakeholder Council. The feedback is summarized below into the following themes.

- IGP Process Scope and Improvements
- Solution Sourcing and Evaluation
- Distribution Planning Process
- Information Sharing
- Stakeholder Engagement

Quotations from the submitted comments are cited in Appendix B with the corresponding number indicated in the brackets (i.e., [1]).

IGP Process Scope and Improvements

Many of the comments received provided suggested improvements to the overall IGP scope and process. Specific comments and suggestions are summarized below.

- Explicitly including sensitivities for aggressive energy efficiency (“EE”) targets and electric vehicle penetration by 2045. [1]
- Providing a summary of risks and mitigation strategies for the IGP Process. For example, how will the Companies mitigate the challenge of inaccurate net load forecasts? [2]
- Guidance that the procurement process outlined in the IGP is not a substitute for comprehensive, long-term planning. As such, more clarity is needed on the relationship between the short and long term planning functions in the various stages of IGP. [3]
 - The concern is that if the short-term becomes the foundation or driver for planning, it may result in an incrementalist approach that loses focus on long-term direction. [3]
- Provide more clarity on how the planning steps and timeframes in IGP correspond to the steps and timeframes under the IRP Framework, with stakeholders specifically

interested in how the IGP may effectively reduce the time for the planning process or truncate the planning analysis in comparison to the IRP Framework. [4]

- A reminder that independent oversight and stakeholder participation requirements of the IRP Framework should be substantively maintained and not diminished or eliminated. [5]
- A couple comments requested information on how greenhouse gas (“GHG”) reduction efforts will be quantified and reported through the IGP process, especially when analyzing scenarios and alternatives. The comments state that reporting on GHG impacts for scenarios and sensitivities supports a holistic review of policy alternatives to inform legislature, state, county climate commissions, and the Public Utilities Commission. [6, 7, 8, 9]
- There were several comments pointing out the relationship between IGP and two open dockets, Distributed Energy Resources (Docket No. 2014-0192) and Performance-Based Regulation (“PBR”) (Docket No. 2018-0088). These comments request that the IGP Workplan discuss how IGP relates to these dockets and what will be done to ensure consistency as each progress. [10, 11, 12, 13]

Distribution Planning Process

The following comments were provided regarding distribution planning:

- Suggestion that the Commission establish a review body similar to the California Distribution Planning Advisory Group (“DPAG”), which functions as an advisory body to the utilities on distribution planning, includes an independent engineer, and, critically, also allows for participation from market participants. [14]
- Suggests the expedited expansion of SLACA analysis to all islands, such that the analysis coincides with the first IGP planning cycle. [15]
- Request for transparency in the identification of needs for a resource choice like aggregated DER and its locational impacts. [16]

Solution Sourcing and Evaluation

Stakeholders provided several comments and suggestions related to solution sourcing and evaluation in relation to scope, process, methods and customer outcomes.

- Request for more definition around what is considered a market solution and urge Commission involvement in establishing and determining the success of an energy services marketplace. [17]
- Suggest that analysis of long lead time infrastructure associated with interconnecting resources and solutions to be explicitly identified in the Workplan. [18]

- Urge the development of standardized tariffs and programs for the procurement of customer-sited DERs. [19, 20]
- It is unclear to what extent and how the IGP will integrate and optimize broader-scale pricing, programs, and tariffs for customer-side resources. This would include time-of-use ("TOU"), DR, DER, and EV programs. Such customer-side solutions do not seem to be addressed in the procurement process and should be integrated into the overall planning analysis. [21]
- Seeking further clarification regarding how the results of resource procurement will be used to inform the overall planning process. [22]
- Competitive bidding may be appropriate for large-scale projects with long lead time and slow developing needs, but are impractical for smaller magnitude projects with shorter timeframes. [23]
- The request to waive the Competitive Bidding Framework ("Framework") is lacking critical details required by the Framework itself. More evidence and details should be provided to support why Competitive Bidding should be waived for the IGP. [24]
- Request additional visibility into what is the right proportionality of utility-owned versus IPP-provided generation. [25]
- Concern that the two-step procurement process, for utility-scale resources and transmission and distribution ("T&D") needs and non-wires alternatives ("NWA"), is top-down and will skew toward centralized, utility-scale resources rather than considering all resources, including distributed, customer-sited solutions, on a level playing field. [26]
- Note that the Value of Service ("VoS") methodology should not be viewed as a "final" product and continued analysis and vetting of the methodology, underlying assumptions, and inputs should occur on a going-forward basis. [27]
- Relying only on market information for price reasonableness could result in customers paying higher prices on an ala carte basis as compared to the price paid for an integrated service. The comparative evaluation conducted in the IGP process should consider services on an all-in basis to ensure that consumers are receiving the maximum benefits associated with any alternative. [28]
- Recommend that two additional principles be utilized when determining the value of grid services:
 - o Value to Ratepayers, which will allow the Companies and the Commission to approve services and solutions that carry the greatest ability to reduce energy costs across the islands and provide maximum value to all customers. [29]

- o Metrics to quantify the contribution to the Renewable Portfolio Standards (“RPS”) targets and reduction of greenhouse gas emissions. [8, 29]

Information Sharing

Comments received regarding information sharing are generally concerned with open access to assumptions and data, as well as transparency on how confidential information from the procurement process will be used for planning analysis.

- It is critical that advisory groups be provided with complete information at all points in the planning process including planning assumptions, data underlying those assumptions, details of projects planned in response to system needs, and any parameters or operational requirements that may be used to establish the Request for Information (“RFI”) and Request for Proposals (“RFP”), or other tariffs and programs. [30]
- Meaningful smart dialogue (two-way discussions with appropriate feedback mechanisms), open and timely access to public data, and early discussion of limited confidential data, will lead to a streamlined process. One of the keys is to make sure that all entities are aware of what data and what assumptions will be relied upon. It is important to identify these early, and to have a robust discussion around them. Even if all parties do not agree, having the dialogue is important. [31]
- Develop a proposal for what, how, when, and to whom information will be shared, specifically with regards to the inputs and outputs from the IGP process diagram. Request that this information be summarized in a chart, table, or bulleted list and provided as a general reference to inform stakeholders on when and how to provide input during the IGP process. [32]
- Further description of how competitively sensitive and confidential information derived from RFIs and RFPs will be used in the planning process. [33]

Stakeholder Engagement

Stakeholders requested more details on the respective roles and interaction of the various groups in the Companies’ stakeholder engagement model. Additionally, stakeholders requested clarification on how public outreach and overall transparency will be incorporated.

- Request for further description regarding the interactions between the Stakeholder Council, Working Groups, Technical Advisory Panel (“TAP”), and customer and public engagement efforts.
 - o Description to include how these groups will communicate and make information available, as well as the role of a potential facilitator in decision-making. [34]

- o Recommend that the Technical Advisory Panel, Stakeholder Council and Working Groups should include cross-pollination from one another to ensure communication and diverse input, or that the groups have a regularly scheduled meeting or call in which the activities of each are made transparent. [35]
- Further description is required to establish how the Hawaiian Electric Companies will actively engage customers and communities to ensure balanced representation. [36, 37]
- Indicate how stakeholders fit into the IGP process and what inputs and outputs are expected from stakeholders. [38]
- Suggest a follow-up public workshop in 2019 to allow the public to provide input as the IGP progresses. [39]
- Recommend that an online forum be developed with information on basic modeling or illustrations that more directly engages the public in understanding and examining alternatives. [40]
- There were several comments regarding the Technical Advisory Panel:
 - o There is concern that the most important and defining issues will be resolved by the Technical Advisory Panel without input from key stakeholders or the public. [41]
 - o Recommendation to the Technical Advisory Panel to solicit input and participation from additional utilities that have experience planning for and leveraging DERs and microgrids. [42]
 - o Suggestion that the Commission and Stakeholders be involved in the selection of the Technical Advisory Panel members, and that membership on the TAP be possibly expanded to include additional stakeholders. [43]
 - o Indication on how the anticipated high work load of the TAP will be funded and who the TAP will specifically represent, i.e. the Companies, ratepayers, or others. [44]
 - o Request information on how the Companies will plan to involve the TAP in comparing options solicited through the RFI and RFP process. [45]

Additionally, there were suggestions on the scope, focus and composition of the proposed working groups. Stakeholder comments are organized below by the associated working group.

Forecast Assumptions Working Group

- Recommendation that the Forecast Assumptions Working Group (“FAWG”) be reformulated as an all-encompassing planning working group whose review will include all aspects of integrated planning. [46]

- Incorporating updated customer load studies into the IGP Workplan. [47]

Market Working Group

- Recommend that the Market Working Group (“MWG”) be re-designated as a Procurement Working Group that seeks to develop the details of all potential procurement methods. [48]
- Request for DER Provider participation in the Market Working Group in order to provide input and feedback on current and foreseen challenges. [49]
- Suggest that the mission of the Market Working Group be expanded to include identification of all barriers to entry in the energy market for new energy services, such as utility incentive alignment, access to data and information, and grid access and interconnection. [50]
- Propose the creation of a Procurement Review Group to support an expedited procurement schedule and provide great visibility into what bids were submitted and how quantitative and qualitative metrics were actively applied in the ranking and selection process. [51]
- Requesting information on who will comprise the group of non-market participants who will conduct a comparative evaluation of wires and non-wires alternatives or traditional versus technology-driven alternatives, as stated in the IGP Report. [52]

Additional Working Groups

- Recommend the creation of a Working Group on Customer Equity and Bill Reduction to focus formally and exclusively on the question of reducing overall energy bills for Hawai'i residents and businesses, along with addressing equity for low-income customers. [53]

Stakeholder Comment Cross Reference

The following is a Stakeholder Comment Cross Reference Table which maps where the stakeholder themes addressed in this Workplan or with which Working Group(s) the specific concerns will be discussed.

| Common Themes | IGP Workplan Cross Reference | Working Group(s) Assignment |
|------------------------------------|--|-----------------------------|
| IGP Process Scope and Improvements | 3. IGP Process Description of Major Steps 3.4. Solution Evaluation & Optimization | Market Working Group |

| Common Themes | IGP Workplan Cross Reference | Working Group(s) Assignment |
|---|---|-------------------------------------|
| | 4. Stakeholder Engagement 5.3.1 Forecast Assumptions Working Group Details | Forecast Assumptions Working Group |
| Procurement Methodologies and Strategies | 3. IGP Process Description of Major Steps 3.3 Sourcing Solutions 5.3.4.4 Streamline Competitive Procurement Working Group | Market Working Group |
| Solution Comparison and Evaluation | 3.4 Solution Evaluation and Optimization | Market Working Group |
| Information Sharing | 4.2 Information Sharing | |
| Distribution Planning Process | 5.3.3 Distribution Planning Working Group | Distribution Planning Working Group |
| Interaction Between Dockets | 3. IGP Process Description of Major Steps | |
| Interaction Between Stakeholder Council, Working Groups, Technical Advisory Panel, and the Public | 4. Stakeholder Engagement | |
| Working Group Recommendations | 5.3 Working Groups | |
| Environmental Impacts | 3.4 Solution Evaluation and Optimization 5.3.4.3 Solution Evaluation and Optimization Working Group | |

3 IGP Process Description of Major Steps

The IGP Report broadly outlined a new innovative approach to energy planning. Customers will benefit since this approach will identify the best mix of options to affordably move Hawai'i toward a reliable, resilient clean energy future. This IGP Workplan provides expanded descriptions details of the major steps and components of the IGP process, including proposed objectives, timelines, and milestones for each step. The IGP process will begin in 2019 with development of the forecast and assumptions and other planning criteria, such as for resiliency. The planning analysis and subsequent steps will follow starting January 2020 as highlighted in the process diagram below (Figure 1):

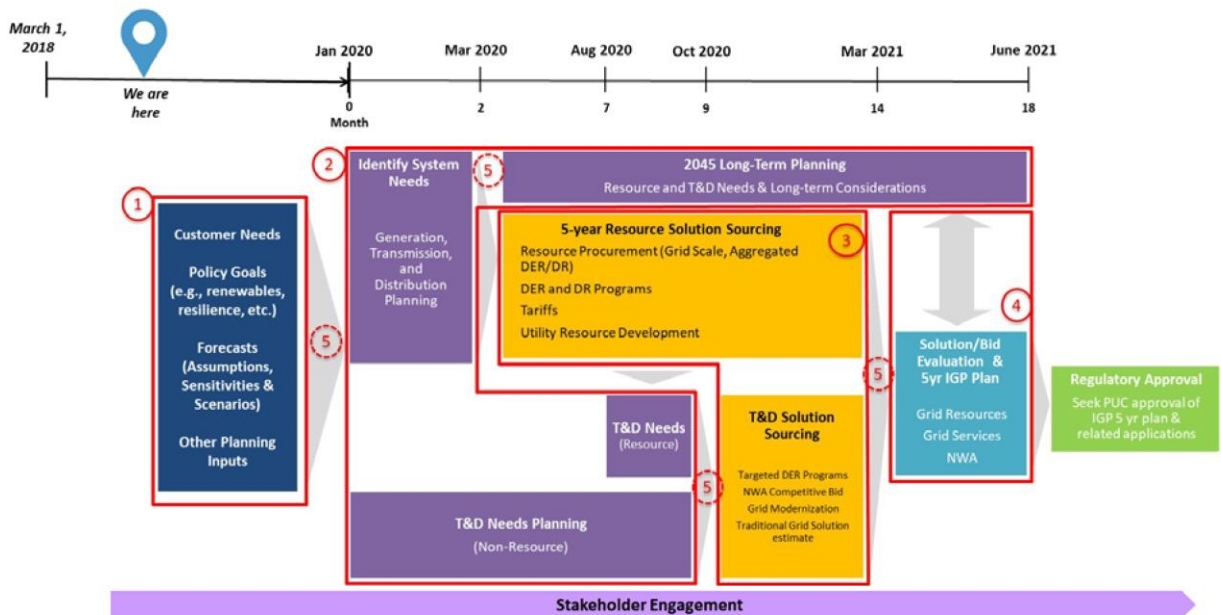


Figure 2: Integrated Grid Planning Process

1. Forecasts and Planning Inputs
2. Identify and Quantify System Needs
3. Sourcing Solutions
4. Solution Evaluation and Optimization
5. IGP Long-Term Plan and Flexibility

The Companies believe this customer-centric, holistic systems planning approach addresses Commission guidance over the past few years and highlighted in its Power Supply Improvement Plan (“PSIP”) Decision and Order No. 34696 (“PSIP D&O”) that the purpose of integrated system planning is to determine a reasonable plan that can serve as a strategic basis and provide context to inform resource acquisition, incremental grid investments, alternatives, and system operation decisions.⁴ The Commission further stated that “well-vetted, credible, comprehensive system analysis is essential to the HECO Companies fulfilling their role to provide a platform to meet the diverse service requirements of their customers by integrating a variety of generation sources and customer-sited resources in an economically and operationally efficient manner.”⁵

Essential to the success of the IGP is the active engagement of stakeholders in an integral and comprehensive manner spanning the entire forecast, planning and sourcing process across resource, transmission and distribution. The Companies are implementing such an all-encompassing approach that leverages best practices, but across a scope that has not been done anywhere in the U.S. to-date as discussed in Section 4.

3.1 FORECASTS AND PLANNING INPUTS

The first major step in any planning process is to develop the objectives and key assumptions that will be used in the analysis. In this respect, the IGP process will build on the successful and transparent process that was conducted to develop the Companies’ PSIP which involved working collaboratively with stakeholders.

The resource planning analyses will be based on broad sets of input assumptions and objectives for the modeling process. As stakeholders have noted, it will be important to coordinate this work with other open dockets on related topics. The IGP process will comprehensively engage stakeholders cooperatively to develop the assumptions data used in the analyses similar to what was described in Appendix J of the PSIP.⁶ Below are the assumptions and planning inputs that the Companies will examine.

Planning Requirements. Fixed parameters of RPS mandates, regulatory and environmental compliance, and overall planning criteria (such as system resilience and reliability, adequacy of supply, system hosting capacity, circuit hosting capacity, service quality, and other factors).

Input Assumptions. Metrics driven by market conditions, modeling inputs, or other factors beyond the Companies’ control. These include fuel price forecasts, resource cost assumptions,

⁴ See Docket No. 2014-0183, Instituting a Proceeding to Review the Power Supply Improvement Plans for Hawaiian Electric Company, Inc., Hawai’i Electric Light Company, Inc., and Maui Electric Company, Limited, Decision and Order No. 34696, issued on July 14, 2017, at 24.

⁵ PSIP D&O, at 24.

⁶ See *PSIP Update Report: December 2016*, filed on December 23, 2016 in Docket No. 2014-0183, Appendix J.

resource potential and performance, power purchase agreements, energy efficiency forecast, and others.

Fixed Assumptions. Existing programs or projects that have been approved or seeking approval, transmission line limitations and upgrade potential, resource retirements, PPA renewals, and generation modernization scope and cost.

Customer Needs and Policy Goals. The IGP will consider resiliency policy objectives, how energy planning can spur economic development of smarter cities and communities through the electrification of other sectors (i.e., transportation), zero net carbon economy objectives including GHG impacts, DER targets, optimal land use, and job creation with Stakeholder Council input.

The Companies recognize the value of including stakeholder engagement from the beginning of the process to support the development of these assumptions. The Forecast Assumptions Working Group (“FAWG”) will provide strategic input and feedback on assumptions and methodologies used for load forecast development and results. The FAWG allows alignment of forecast efforts with experts in forecast methods and subject matter experts for key forecast inputs.

The FAWG will solicit stakeholder input and feedback on key forecast components, data sources and major forecast layers. The working group discussions will include expert panel presentations on customer behavior, energy efficiency, distributed energy resources, and electrification of transportation assumptions to inform stakeholders and the Companies on customer perspectives as well as economic and technical considerations. In addition to evaluating behind the meter technologies such as solar photovoltaic (“PV”) or electric vehicles (“EV”) by traditional customer classes, discussions surrounding adoption by different market segments and location will be conducted. The working group will discuss methods to address uncertainties through forecast scenarios and sensitivities such as different target levels of energy efficiency and electric vehicles.

Throughout this process the aim is to foster collegial, balanced stakeholder discussions to achieve shared understanding of the forecast process and its importance to planning results through iterative discussion and feedback. For example, it is envisioned that the FAWG would present assumptions and methods used for developing the forecasts to the IGP Stakeholder Council (“SC”) and seek feedback as well as what sensitivities and/or scenarios should be considered. After the FAWG completes the forecasts, it would be presented to the IGP SC for feedback before finalizing.

The Companies are currently planning to spend 2019 developing a strong foundation for the IGP process by launching the FAWG and developing the forecasts and other planning inputs for the system needs analysis discussed below. The final forecasts and planning assumptions will be documented and made publicly available on the Companies’ IGP website.⁷

⁷ See Companies’ IGP website at <https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning>.

3.2 IDENTIFYING AND QUANTIFYING SYSTEM NEEDS

The iterative process for identifying and quantifying system needs begins with the forecasts and other planning criteria described above. The IGP process will build on the PSIP process and methods by integrating enhanced distribution planning into the system needs identification to develop a distilled set of resource, transmission and distribution system needs in technology neutral terms as illustrated in Figure 3 and described in detail below. The resulting system needs will be documented in two reports, a Resource Needs report and a Transmission and Distribution Needs and Ancillary Services Requirements report that will be shared with stakeholders through public workshops and posted publicly online on the IGP website.

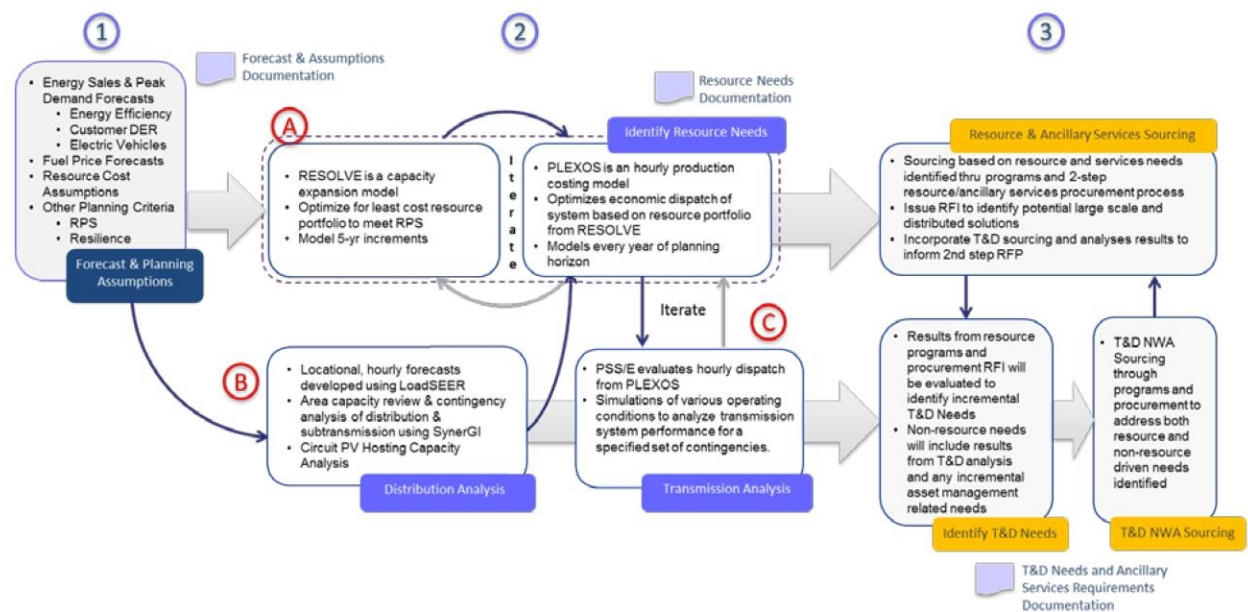


Figure 3: Integrated System Needs Analysis Process

This is a significant advancement in planning for Hawai'i given the importance of distributed energy resources to meet Hawai'i's renewable energy goals. This is also a significant and challenging advancement in electric industry planning and engineering practices. For this reason, the Companies have formed an independent Technical Advisory Panel to act as a sounding board on a range of complex planning and engineering issues that will need to be resolved in conducting this integrated analysis. As stated by the Commission in its Order No. 35569:

Utilities, regulators, and stakeholders across the nation are striving to innovate planning activities. Together, these innovations amount to a paradigm shift. . . . [T]he IGP report is both a product of this paradigm shift, keeping pace with

innovations from elsewhere, and a potential model for others who engage with the challenges and opportunities in the transition to a clean energy future.⁸

The initial step in determining overall system needs involves identifying the incremental resource adequacy needs in terms of energy and related capacity as well as the incremental amount of grid services (i.e., those related to ancillary services)⁹ required to meet system operational reliability criteria. A prerequisite for this step is the further development of ancillary services as part of a broader definition of unbundled grid services, as described by the Commission.¹⁰ The Consumer Advocate also encouraged Hawaiian Electric Companies to unbundle the costs of service and use them for evaluation of various alternatives in their filed comments. [28] Clear definition of these services enables the determination of the quantity and other performance attributes in a technology neutral manner. To support this first IGP planning cycle, it is necessary to begin to identify and define the additional grid services in technology agnostic terms building on the work developed for the Demand Response portfolio in Docket No. 2015-0412. A Grid Services Working Group will be formed as discussed in Section 5 of this Workplan.

3.2.1 Resource Needs

Identifying resource needs involves building upon the multi-step methods described in Appendix C of the PSIP.¹¹ Energy and Environmental Economics' ("E3") RESOLVE capacity expansion modeling tool will be used to develop theoretical optimal resource plans that fulfill policy objectives such as RPS, while subject to resource availability constraints and other fixed assumptions, including minimizing costs. RESOLVE will utilize the forecasts and planning input developed by the FAWG, as well as any other considerations provided by the working groups, such as the Stakeholder Council and technical suggestions by the TAP.

RESOLVE by itself, however, is not able to complete the analysis required to fully develop near term action plans because it lacks the granularity needed to completely evaluate the variability of intermittent renewable resources. It does not provide an hourly dispatch, which is necessary to understand the systems' ability to serve load and for subsequent analysis (in PSS/E), which is performed to identify system reliability resource needs for frequency, voltage, and rotor angle stability; as well as estimate customer rates and bills. RESOLVE relies on a sample of hourly net loads to determine hourly dispatch as opposed to use of annual hourly or 15-minute net loads used by PLEXOS and other models. Accordingly, RESOLVE is useful for developing longer term expansion plans over a wide range of input scenarios and assumptions. However,

⁸ See Docket No. 2018-0165, Order No. 35569 *Instituting a Proceeding to Investigate Integrated Grid Planning*, issued on July 12, 2018, at 6.

⁹ The Federal Energy Regulatory Commission (FERC) defines ancillary services as: "those services necessary to support the transmission of electric power from seller to purchaser given the obligations of control areas and transmitting utilities within those control areas to maintain reliable operations of the interconnected transmission system." See FERC Glossary, available at <https://www.ferc.gov/market-over-sight/guide/glossary.asp>.

¹⁰ See Docket No. 2015-0412, Decision and Order No. 35238, issued on January 25, 2018, at 96-98.

¹¹ See *PSIP Update Report: December 2016*, filed on December 23, 2016 in Docket No. 2014-0183, Appendix C.

the RESOLVE expansion plans must be validated to ensure that they maintain system reliability as more renewable energy is integrated into the grid toward the goal of 100% RPS. The Companies recognize that traditional capacity planning criteria such as reserve margin and loss of load probability that only looks at peak demand will not be sufficient to address an increasing penetration of variable renewable generation and energy storage. Therefore, the Companies will be reviewing and updating the planning criteria in 2019 in discussion with the TAP.

Therefore, the resource portfolio selected in RESOLVE will then be passed through to the PLEXOS model to be analyzed at a more granular, hourly resolution for every year in the planning horizon through year 2045. This multi-step modeling process will allow for more detailed operating characteristics (such as regulating reserve and ramping capability) and system stability constraints to be considered, fine-tuned by the resource selection output from RESOLVE, and will ensure reserve requirements can be met over the entire 8,760 hours in a year. In the PSIP, regulating reserve requirements were defined by the GE HNEI formula for O'ahu and EPS formula for Maui and Hawai'i Island, and were used as modeling assumptions for PLEXOS. The amount of regulating reserve required on the system will become increasingly critical as the amounts of non-synchronous renewable variable generation integrated also increases. For this reason, the Companies will re-evaluate these methods for calculating regulating reserve requirements in 2019, as part of the planning input phase of the process. Enhancements to these requirements will continue to be made as the Companies review actual operating data and gain more experience operating the system as the penetration of non-synchronous renewable variable generation grows.

Resource optimization in RESOLVE and resource portfolio validation in PLEXOS will be used to determine and validate both the near term resource needs for procurement and the resource plan for the long term planning view. This analytical approach is consistent with the resource optimization model suggested previously by the stakeholders and orders from the Commission as used in the development of the PSIP.¹² However, while RESOLVE will select resources based on resource costs developed from information available from IHS Market and National Renewable Energy Laboratory ("NREL"),¹³ the subsequent procurement would be technology neutral by only specifying the system need.

Input from distribution planning, including any Transmission and Distribution ("T&D") or Ancillary Service needs that may increase system hosting capacity for DER adoption forecasted, will be incorporated into the PLEXOS analyses. The output of the modeling analyses will be the identification of resource and grid services needs to be remedied in a technology neutral manner, unless specific technology needs and attributes are identified as required or having specific characteristics critical to maintaining system stability. This is consistent with the Value of Services ("VoS") methodology from the Commission's Decision

¹² See PSIP D&O, at 12.

¹³ See IHS Markit, <https://ihsmarkit.com> and NREL Annual Technology Baseline (ATB), <https://atb.nrel.gov/>

and Order No. 35238.¹⁴ The VoS approach will allow for evaluation of diverse resources and options relative to one another in the Resource and Grid Services Solution Sourcing. As indicated in the IGP Report, the Companies believe the VoS analysis can be refined and used for comparison to market pricing. The VoS methodology would continue to evolve on a going-forward basis, as suggested by the Consumer Advocate's comments that were filed. [27] The Companies describe the VoS in more detail in Section 3.4.

If all the forecasts and planning inputs are finalized by the end of 2019, then the identification of the resource needs can occur from January to March 2020.

3.2.1.1 List of Issues to be Resolved

The following issues will need to be further explored for the IGP process.

- 1) In 2019, the Companies will re-evaluate the methods for calculating regulating reserve and ramp requirements as well as capacity planning criteria including identifying potential alternative technical methods with the TAP's assistance and stakeholder input.
- 2) Identification and definition of additional energy, capacity, ancillary and T&D non-wires alternatives services will need to be addressed by the Grid Services Working Group.

3.2.2 Distribution Needs

Distribution planning is integral to the resource needs assessments given the role of DER in meeting the State's renewable energy goals. The approach to identifying distribution needs described below is a significant change from traditional deterministic distribution planning practiced throughout the country. It reflects the leading edge of industry practices that continue to evolve in sophistication to address a more distributed energy future. In this regard, the Companies have already taken steps to integrate changing customer needs and choices into this distribution planning process as, for example, solar PV has become a ubiquitous technology choice of customers. However, additional improvements are currently underway to develop a more adaptable and granular methodology as integration of solar PV transitions to a wider range of DER including flexible solar, batteries, electric vehicles, and flexible, intelligent load management. In this context, the distribution planning steps described below provide the basis for defining and quantifying grid needs at the distribution level.

Local Forecasting

Development of granular 10-year load and DER forecasts at the distribution circuit level is needed to address the specific locational aspects of the electric distribution system. These forecasts, while a bottom-up approach, will align to the system forecasts and assumptions

¹⁴ See Docket No. 2015-0412, Decision and Order No. 35238, issued on January 25, 2018, at 96-98.

discussed earlier.¹⁵ The starting point of the circuit level load forecasts is the previous year's substation transformer (and circuit) loading data from the Companies' SCADA system and other historical circuit or local level data to identify the highest peak load demand observed at the substation transformer. Along with historical loading information, other inputs that contribute to the 10-year distribution forecast include: new customer service requests (i.e., from new housing developments), information from marketing or the media related to potential real estate development, and historical load growth rates, which are geographically dependent. However, there is a high degree of uncertainty in these granular forecasts beyond a five year horizon. Traditionally, forecasts within a 5-10 year window are typically used to generate long range distribution circuit plans for areas that have an abnormally high amount of load growth.¹⁶

One of the improvements to the forecasting cycle that the Companies anticipate implementing in time for the first IGP cycle includes the incorporation of geospatial, demographic, and economic factors to assist in the development of the five- to ten-year circuit-level load forecasts. Additionally, the Companies will integrate circuit level DER forecasts into the planning of the distribution system. This bottoms-up approach will assist in determining the geographic location and the expected timing of adoption that will tie new load and behind-the-meter assets to their electrical location on the distribution system.

In addition, the improved forecasting cycle includes delivery of time varying load and DER profiles. Because forecasts may have a direct impact on triggering distribution needs, particularly, forecasts that include non-firm projected load growth, circuit-level forecasting should be discussed in the FAWG to resolve issues, including but not limited to, the sensitivities (i.e., high and low) and forecasts that will serve as inputs to the distribution system analysis, the method for selecting economic and geospatial forecasts, among others.

Distribution Circuit Needs Identification

The second step of the integrated distribution planning cycle is the needs analysis. This involves analyzing existing distribution circuit capacity, contingency, and DER circuit hosting capacity.

Area Capacity Review and Contingency Analysis

Area or system reviews are performed on the distribution and sub-transmission system – utilizing the inputs from the forecasting cycle – to ensure that the forecasted circuit and

¹⁵ While the DER related forecasts at the circuit level and system level are expected to converge, the system level load forecasts may not converge with circuit level forecasts.

¹⁶ For example, a developer may submit plans for a large community many years in advance. Although the project may not begin within the normal 5-year planning window, distribution planning will study the overall development and produce estimated high-level electrical loading conditions to provide developers prospective infrastructure requirements. With this information, and although the project is many years away, the customer can begin working with the electric utility to allocate and designate the land and right of ways necessary to accommodate such infrastructure requirements.

substation loading do not violate distribution planning criteria¹⁷ in the current year or in future years. The planning criteria covers the equipment loading thresholds for both normal and contingency (emergency) conditions. As illustrated in Figure 4, below, analysis is conducted to ensure that the current flowing through distribution equipment (e.g., conductors, breakers, and transformers etc.) does not violate the planning criteria for thermal loading of equipment during normal conditions in any of the time periods studied.

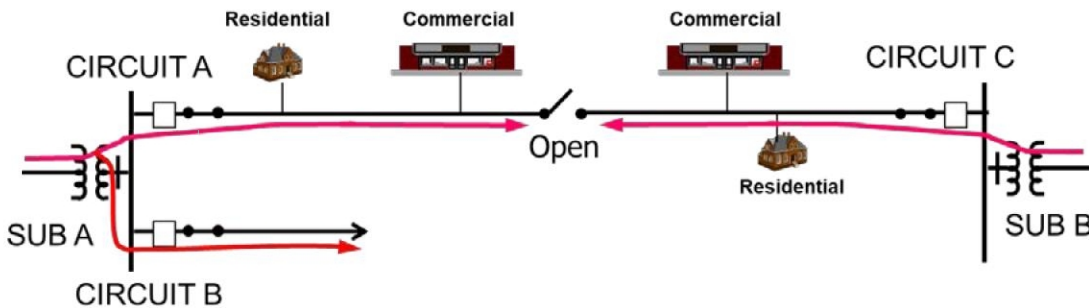


Figure 4: Illustrative power flow of two adjacent substations operating in a normal configuration

The distribution system is also designed to withstand planned and unplanned contingency or emergency situations. Figure 5, below, illustrates an emergency condition. The planning criteria for these situations generally state that a substation transformer shall have the capacity to not only accommodate the highest peak demand and any forecasted load growth, but also accommodate the additional transferred load from the loss of a neighboring substation transformer (sometimes referred to as N-1 reliability). The same planning analysis that applies for load growth also applies to DER growth except that power may be flowing in the opposite direction.

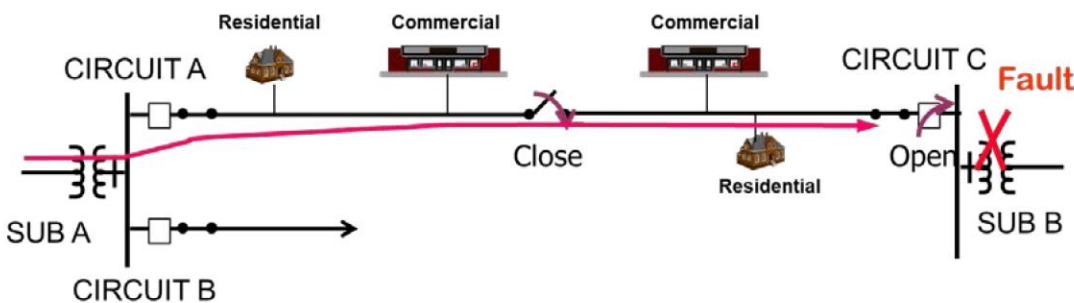


Figure 5: Illustrative power flow of two adjacent substations operating in an emergency or contingency configuration

Area reviews of the distribution system are not only performed subsequent to the completion of the forecasting cycle, but also based upon operational needs and service requests submitted by customers throughout the year.

¹⁷ Failure to satisfy distribution system planning criteria increases the risk of equipment damage during normal or emergency conditions that may lead to long extended service interruptions to customers.

The results of the area capacity and contingency analysis, such as equipment overloads due to projected load growth, is one way distribution grid needs will be identified.

Circuit PV Hosting Capacity Analysis

PV hosting capacity analysis estimates the amount of PV that can be accommodated (regardless of location) on a circuit without violating power quality or thermal loading criteria and without requiring mitigation or infrastructure upgrades. The distribution planning analysis evaluates (1) voltage power quality, (2) equipment and wire capacity, and (3) operational flexibility to verify that these three measures comply with distribution planning criteria. There are many more potential impacts that can affect the safety, reliability, and power quality of electric service to our customers, but these three criteria are the primary concern for distribution planners. The evaluation of equipment capacity and operational flexibility is no different than the process described above for forward flow of power to serve load.

Circuit-level hosting capacity serves three purposes, applying it as a tool to (1) streamline the interconnection process for customers, (2) inform customers and DER developers where circuit constraints are located, and (3) inform the planning process and identify circuit constraints to be resolved to facilitate DER growth. These use cases are consistent with industry best practices¹⁸ as presented at the Companies' Integrated Grid Planning Symposium held on November 15-16, 2017.¹⁹

Within the context of IGP, the hosting capacity analysis will focus on the third use case: identifying circuit constraints that need to be resolved to facilitate DER growth. Similar to the area capacity analysis, the hosting capacity analysis will identify grid needs triggered by violations of planning criteria that must be solved to integrate a set of DER forecasts, including DER that may deliver grid services.

Distribution Planning Process Improvements

In 2018, distribution planners began implementing improvements to their analysis methodologies from one that is largely static and deterministic to a dynamic, granular analysis that integrates load growth forecasts along with DER forecasts to better reflect the benefits or impacts of customer adoption of all DER types. The improvement specifically incorporates time varying load and DER profiles into the area and circuit hosting capacity analysis to identify grid constraints and needs. Incorporating profiles of the various DER technologies being adopted by customers will allow for more precise simulations that reflect the cumulative net benefits and impacts of different types of DER programs and resources, such as Customer Self-Supply ("CSS"), Smart Export, EVs, and TOU rates.

¹⁸ See ICF, Utility Practices: Hosting Capacity and Locational Value Assessment (Nov. 15, 2017), available at https://www.hawaiianelectric.com/documents/clean_energy_hawaii/grid_modernization/igp_symposium/2_1_samir_succar.pdf at 3.

¹⁹ See Hawaiian Electric's Integrated Grid Planning Symposium, available at <https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning/integrated-grid-planning-symposium>.

Technology-Neutral Distribution Needs

As illustrated in Table 1 from New York,²⁰ the analysis cycle will identify distribution grid needs that are technology-agnostic to foster innovative market-based solutions, including non-wires alternatives.

| Type of System Data | Illustrative Example |
|--|--|
| Size of the need | 1 MW |
| Temporal profile of need | Between the hours of 1 and 4 PM, for no more than three consecutive days |
| Duration of deferral | Five years |
| Geographical characterization of need area | A map showing the approximate boundaries of the need area, perhaps labeled with zip code information |
| Customer characterization of need area | Approximately 2,000 customers, split 80 percent residential and 20 percent commercial and industrial |

Table 1: Illustrative Example of System Data to Be Included in NWA Solicitations

Non-wires alternatives (“NWA”) generally are non-traditional solutions that may defer, delay, or avoid traditional investments (e.g., a new substation). Non-traditional solutions can include a single solution or combinations of solutions at the grid-scale or distributed level such as, solar, energy storage, energy efficiency, demand response, distributed generators, among others. For example, Green Mountain Power implemented a microgrid solution as a NWA to a distribution line that incurred high maintenance cost due to vegetation.²¹ In other examples, Consolidated Edison solicited DER solutions to provide demand relief to certain portions of the distribution system to defer a traditional distribution investment.²²

The Companies will develop a five-year prospective look at the distribution system that identifies the distribution system needs. This will include identified locational needs triggered by resource and non-resource needs (i.e., distribution capacity expansion). This information will be combined with transmission needs into a single T&D needs report. The first T&D needs identification study cycle is expected to commence in August 2020 and run through October 2020.

In Order No. 35569, the Commission noted, “[t]he conventional distribution planning process has largely been conducted internal to the Companies, outside of commission and public view.”²³ County of Hawai‘i in its comments on the IGP Report, specifically asked, as it relates to

²⁰ Adapted from *Joint Utilities Supplemental Distribution System Implementation Plan*, Case 16-M-0411, In the Matter of Distribution System Implementation Plans, November 1, 2016, at 104.

²¹ See Cherise Madigan, *Emerald Lake State Park Teams with Grassroots Solar for Energy Project*, Bennington Banner (Sept. 29, 2017), available at <http://www.benningtonbanner.com/stories/emerald-lake-state-park-teams-with-grassroots-solar-for-energy-project.520740>.

²² See Consolidated Edison Company of New York, Inc., *Non-Wires Solutions*, available at <https://www.coned.com/en/business-partners/business-opportunities/non-wires-solutions>.

²³ Docket No. 2018-0165, Order No. 35569, at 19. The Commission elaborated in the adjoining footnote: “Certain aspects of the HECO Companies’ distribution planning efforts, such as the integration capacity analyses included in the PSIPs, have been publicly accessible and

Distribution Planning, “what kind of transparency will these issues be given by the Company, and it requires elaboration.”²⁴ [16] In response to comments received from stakeholders, the Companies will create a Distribution Planning Working Group (“DPWG”) as part of the IGP stakeholder engagement process.

The purpose of this Distribution Planning Working Group is to (1) inform and share information with stakeholders on the current integrated distribution planning process, (2) collaboratively seek input and co-develop distribution planning process improvements with stakeholders, (3) transparently share planning results and identified needs (except where information may provide a competitive market advantage or be considered critical infrastructure which could jeopardize Homeland Security), and (4) refine the information needed by NWA providers to ensure successful solution proposals within the solution sourcing process. This is further described in Section 5.

HPVC recommended that the forecast working group be reformulated as a wider planning group to include all aspects of integrated planning, similar to the California Distribution Planning Advisory Group (“DPAG”)²⁵ that advises the utilities “on selection of distribution deferral opportunities and providing input on the development of competitive solicitation for DERs” for the NWA pilots. [46] The California model was proposed to address the need for a level of transparency that the overall stakeholder engagement process including the proposed IGP Distribution Planning Working Group and Grid Services Working Group provide. It is important to note that the California DPAG is not as comprehensive in its scope as proposed by the Companies’ IGP. The California DPAG only considers distribution needs and not resource or transmission needs collectively as in IGP. Additionally, the individual groups and processes in California for resource, transmission and distribution also do not consider any synergies from an integrated assessment and solution sourcing as in IGP. As such, the IGP process is a significant improvement on the California approach. The Companies address stakeholder involvement in the solution sourcing and overall stakeholder engagement in Sections 3 and 5, respectively.

Also described in Section 3.3.5, the Companies plan to initiate a soft launch of the solution sourcing process to address grid needs identified in the prior PSIP analysis, and to gain experience with non-wires alternatives from DER service providers to address non-resource distribution needs. The soft launch sourcing and evaluation effort is anticipated to be conducted between January 2019 and August 2020. Stakeholders will be invited to public workshops and a subsequent prospective bidders’ conference to learn more about the NWA capacity deferral opportunity.

the subject of stakeholder discussion in commission proceedings. However, the bulk of the distribution planning function has historically been conducted internally at the Companies.”

²⁴ Docket No. 2018-0165, *County of Hawai‘i’s Comments on the Hawaiian Electric Companies’ Integrated Grid Planning Report*, filed on October 10, 2018 (“COH Comments”), at 16.

²⁵ See California PUC, *Decision Addressing Competitive Solicitation Framework*, December 15, 2016, IDER Proceeding D.16-12-036.

3.2.2.1 List of Issues to be Resolved

The following issues will need to be further discussed in the Distribution Planning Working Group:

- 1) The type of scenarios to be considered in the distribution needs analysis.
- 2) The type of information required by DER developers and third parties to submit bids for NWAs.
- 3) The type of information the Companies will need to appropriately assess the technical efficacy of proposed solutions.

3.2.3 Transmission Needs

The Companies conduct transmission planning for the islands of Hawai'i, Maui, and O'ahu.²⁶ The transmission system forms the backbone of the electric grid and is designed to be both reliable and resilient while efficiently transmitting bulk power to distributed load centers. The transmission system is a network of high-voltage conductors designed to efficiently deliver bulk-power from central-station generation to the load centers under normal and adverse conditions (e.g., the planned maintenance or unexpected loss of the transmission line). The transmission planning criteria establishes the design parameters for each island system. Generally, the transmission network surrounding generating stations is very robust compared to the network surrounding the load centers so bulk energy can be delivered to the load centers under planned contingency events (e.g. N-1-1 transmission line outages).

Interconnecting large generating facilities to existing transmission lines changes the power flow dynamics of the system from its original design, so the location of these resources have an impact on system reliability. For example, two parallel transmission lines connect the Kahe and Halawa Substations that are essentially redundant circuits. If a large generating facility is added to one of these circuits, they are no longer redundant circuits because power flow characteristics will change. It can take many years to plan, permit, engineer, and construct a new transmission line, therefore prudent planning is required to tap renewable energy resources in remote areas like the North Shore of O'ahu.

These transmission planning studies are performed to support the following activities:

- Provide transmission infrastructure to respond to load growth;
- Ensure the transmission system can maintain operating equilibrium for a set of predefined contingency events;
- Interconnect new generation resources, including customer and community adoption of DER;
- Evaluate system performance to contingency events; and

²⁶ The islands of Lana'i and Moloka'i are radial distribution systems and are not governed by the Companies' transmission criteria or TPL-001. Studies are performed to ensure these systems can withstand disruptions from a sudden disturbance or contingency and maintain operating equilibrium.

- Additions and/or modifications to large generating resources, energy storage systems, and transmission system components.

The need for these planning studies will be determined on an annual basis depending on changes to the system. The long-term planning study determines the transmission capacity needs to first interconnect generating facilities and second, meet system load growth.

Transmission planning criteria (including resiliency) in conjunction with TPL-001 establishes the design parameters and analysis requirements necessary to plan, operate, and maintain the transmission system. The TPL-001 requires planning assessments for the near-term and long-term transmission planning horizons. Collectively, several modeling simulation studies define transmission system needs, including an annual planning assessment required by TPL-001; the interconnection requirement study ("IRS"); and the analyses of the long range resource plans developed in this IGP.

Transmission planning studies are based on simulations performed in PSS/E using detailed system models under different operating conditions (daytime minimum, daytime peak, evening minimum, and evening peak) to analyze system performance for a specified set of contingencies. Steady-state and/or dynamic simulations are performed for each island system to ensure system parameters such as voltage and current are maintained at acceptable levels to ensure public safety, protect customer and utility equipment, and ensure reliable service.

These studies analyze changes to the island's transmission system from multiple generation interconnect requests, changes in load and DER growth, and the displacement of fundamental grid services provided by synchronous generators, and determine technology-neutral requirements to maintain system reliability. The studies evaluate the ability of the system to withstand disturbances or contingencies from a loss of generation or an electrical fault, causing sudden changes to frequency, voltage, and current. Operating equilibrium following these disturbances must be restored to ensure public safety and to prevent damage to customer and utility equipment.

The analyses performed for the IGP will focus on system security analysis on weak-grid issues, as inverter-based generation displaces synchronous generation. Optimized resource plans, output from the PLEXOS production simulations, will be screened to select representative cases for further analysis. Steady-state and dynamic simulations are performed in PSS/E to determine system requirements for various contingencies. Transformation of the Companies' electrical systems will require new software tools to fully analyze DER impacts to the bulk transmission system and to analyze weak electrical systems, typically characterized by low inertia and low short-circuit current.

This is different from the IRS which analyzes the system impacts of interconnecting generating facilities for a given service date and contract proposal. Analyses include steady-state and dynamic stability in PSS/E, short-circuit analysis in ASPEN, PSCAD analysis for the facility and weak-grid system impacts, and determines mitigation alternatives if required. The IRS is an integral part of the Power Purchase Agreement ("PPA") negotiations and is included as an

attached exhibit in the PPA docket. Results of the IRS will help justify any near-term system upgrades required to interconnect these facilities.

If the need for a new transmission line is identified, a robust non-transmission alternative (“NTA”) sourcing solutions procurement process and alternatives analysis will be conducted to ensure the most cost-effective solution is implemented consistent with prior Commission direction.²⁷

The design of the electrical system is based on the inherent characteristics of synchronous generators. In addition to real and reactive power, synchronous generators provide rotational inertia and short-circuit current to the electrical system; two fundamental grid services required to properly operate the system. A system with more synchronous generators (higher short-circuit current) is less susceptible to disruptions from electrical faults, and other power quality characteristics such as harmonic distortion and flicker. Besides system reliability, maintaining a minimum amount short circuit capacity is paramount to ensure public safety. Distribution systems utilize over-current protections schemes to properly isolate electrical faults and ensure public safety. The time it takes to isolate a distribution fault is inversely proportional to the capacity of short circuit current. Therefore, reducing the available short circuit current increases the time it takes to isolate the electrical fault.

Results of these transmission planning and protection analyses will be summarized in the T&D needs and ancillary services requirements document that will be shared publicly with the IGP stakeholders. These identified transmission system requirements to prevent equipment overloads and/or to maintain system stability will be identified in technology neutral terms. These requirements may include things such as kinetic energy (inertia), fast frequency response (“FFR”) reserves, primary frequency response (“PFR”) reserves, reactive power (“MVAR”), and short-circuit current from synchronous machines in megavolt-amps (“MVA”).

3.2.3.1 List of Issues to be Resolved

The following issues will need to be further explored for the IGP process.

- 1) The Companies must develop new performance metrics and revise its transmission planning criteria to maintain system reliability as we integrate more inverter-based generation into each island system. Displacement of synchronous generation has an adverse impact on all frequency, voltage, and rotor angle stability. We will investigate best practices to maintain system security and identify new performance metrics and criteria, and develop mitigation strategies with the TAP’s assistance and stakeholder input.
- 2) The Companies must enhance its analytical capabilities to evaluate grid strength of electrical systems that have high penetration of inverter-based generation replacing

²⁷ Docket No. 2012-0036, Decision and Order No. 32052, issued on April 28, 2014, *Exhibit A: Commission’s Inclinations on the Future of Hawaii’s Electric Utilities* (“Commission’s Inclinations”), at 12.

traditional synchronous generation. Enhancements include new analytical tools, improved models (generators, exciters, load, protection systems, etc.), and utilizing results from advanced analytics like a weighted short circuit ratio study to establish long range transmission planning criteria. We will investigate new analytical tools, modeling best practices, and new analysis methodologies with the TAP's assistance and stakeholder input.

3.2.4 System Needs Documentation

The system needs will be provided in two public documents, the first for resource requirements, such as energy and capacity, after the resource needs identification step (A) of Figure 3: Integrated System Needs Analysis Process described above. The second, documenting the transmission and distribution needs and ancillary services requirements will be provided after steps (B and C) of Figure 3. Both system needs documents will be posted on the IGP website. The identified needs will also be incorporated into the technical requirements for the respective sourcing options. Consistent with IGP process principles, the needs will be described in technology agnostic terms.

3.3 SOURCING SOLUTIONS

Sourcing of the above-mentioned resources for system needs will generally involve identification and acquisition of services through two basic interfaces (1) direct customer engagement through pricing and programs, and (2) contracting with developers and/or aggregators via competitive procurements. This process will involve the definition of the steps for each sourcing method and determine the sequencing and degree of coordination among these two sourcing processes; ultimately, the process will need to be fair to all solution providers and all customers – participating or otherwise.

The IGP solution sourcing and evaluation steps are illustrated by the yellow (③) and light blue (④) gears in the overall IGP process diagram, Figure 6 below. Although the process appears to be flowing from one step to the next, the process is actually iterative. The process for sourcing and procuring solutions to meet identified grid needs was described in Section B.2.2 in the IGP Report. The IGP process will use the full suite of options in sourcing resources (energy and capacity services), ancillary and T&D non-wires services, including RFI, RFP, programs and developing new tariffs. Additionally, there is a role for utility-build options to meet specific needs, but in response to comments made by the County of Hawai'i, the Companies do not have a predetermined ratio of utility-owned versus IPP-provided generation.[25] Ultimately, solutions that provide the best fit to system needs will be selected regardless of ownership.

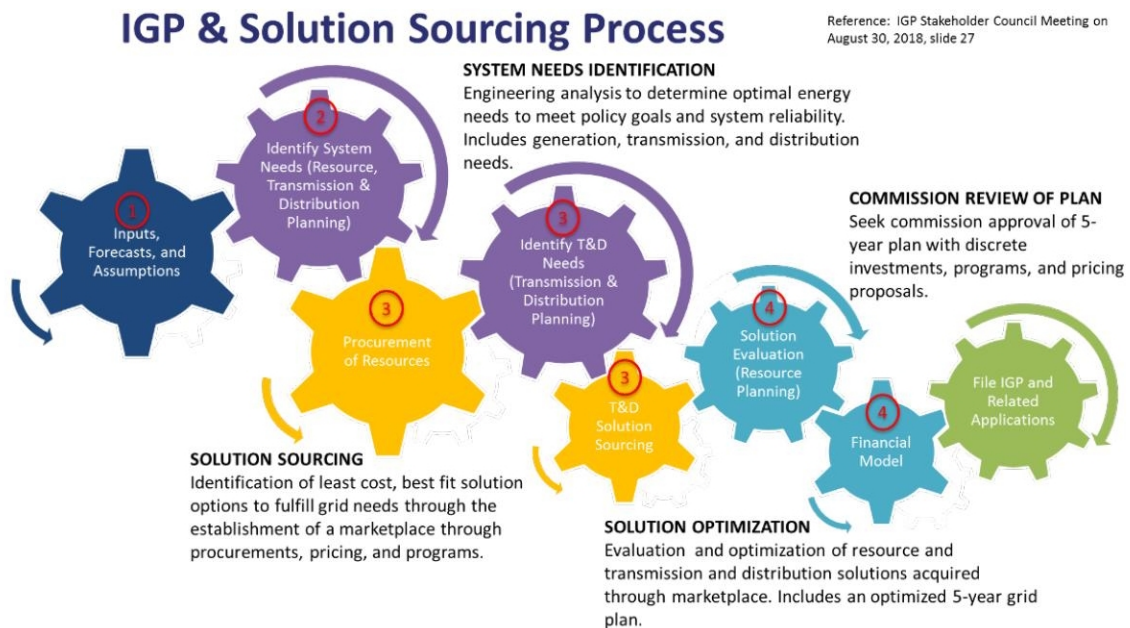


Figure 6: IGP & Solution Sourcing Process

Once incremental resource and grid services needs have been identified, the Companies will initiate sourcing of solutions that meet these needs. The objective of sourcing solutions at this point is to identify actionable solutions, which will in turn enable the Companies to (1) assess transmission and distribution improvements or upgrades to integrate each solution, and (2) use pricing from market-based proposals to determine the lowest reasonable cost portfolio of solutions to address bulk system, transmission, and distribution needs. This represents a significant improvement over current planning methods that use cost assumptions and are unable to account for project size, location, and transmission and/or distribution needs and corresponding costs to integrate to the system. Moreover, current planning methods do not fully capture technology innovation and the full breadth of solutions that could be provided by market participants. Market participants are unlikely to disclose innovative solutions outside of a procurement process for competitive reasons. The proposed IGP process affords an opportunity for market participants to propose these innovative solutions as an integral part of developing the 5-Year IGP Plan.

3.3.1 Pricing

Customers will continue to have an option to benefit directly from adoption of DER as well as from any value their DER may provide to the power system. In line with the comments from HPVC to seek standardized programs for customer-sited DER procurement, the Companies will propose a new long-term Standard DER Tariff to succeed the interim tariffs currently available (e.g., CSS, CGS, CGS+, and Smart Export). [19, 20] The Standard DER Tariff will

include consideration for export energy that is non-dispatchable.²⁸ Non-dispatchable resources under Standard DER Tariffs will not fully satisfy the need for firm energy and flexibility needed to meet Hawai'i's needs. Therefore, it is expected that annual MW program targets will be needed. However, there will be a significant need for dispatchable resources. DER may provide additional services informed by the system needs analyses described above for each island. As such, programs and procurements will also be used to source dispatchable energy and grid services to achieve the scale and flexibility needed to reliably and cost-effectively achieve 100% renewable energy so that customers that have invested in DER (including those under the standard DER tariff) can maximize the value and utilization of their DER. This is consistent with the Commission's Inclinations.²⁹

While the Standard DER Tariff described above is the initial near-term step in the "Pricing" realm, the Companies envision that pricing can evolve to more dynamic pricing schemes, such as day-ahead pricing schedules for energy services as an example. This future-state pricing schedule reflects another convergence of DER and DR, which is also reflected in the competitive procurement of Capacity and other Ancillary Services via customer resources.

3.3.2 Programs

Programs enable customers to participate directly in opportunities to provide grid services utilizing their own assets. What distinguishes programs from pricing is certainty in the grid service being provided. In a Pricing scenario, a customer takes an action in response to an economic signal. In a program there is greater certainty based on either (1) customer assets' responses are triggered by an explicit signal that originates from the utility or from the grid itself, or (2) a program results in the installation of equipment or devices that have a reliable effect on the grid that can be mapped explicitly to a needed service. For the purposes of this discussion, the bulk of "Programs" refers specifically to energy efficiency ("EE") programs administered by Hawai'i Energy. Programs other than EE programs, however, are expected to generally represent a more costly approach than either Pricing or Procurement. For that reason, other customer participation, primarily those involving the installation of assets that provide energy, capacity and other ancillary services, is expected to occur through a combination of Pricing, and the Competitive Procurement process.

²⁸ DER resources installed under the standard DER Tariffs will not be directly controlled or dispatchable by the Companies except in system emergencies, i.e., during system energy imbalances, where DER systems will be separated from the utility grid using the second advanced meter or through an aggregator service.

²⁹ The Commission noted in its Inclinations, "Consistent with meeting the future needs of Hawai'i's island grids, the electric systems should evolve such that all generation resources, whether utility, IPP or customer-owned, will contribute to maintain system stability. Therefore, to maximize the integration of variable renewable energy resources, the Commission expects the HECO Companies to require all generators to address and support system stability consistent with their resource characteristics and state-of-art technical capabilities." Commission's Inclinations, at 7.

Energy Efficiency

The Companies propose that enhanced, services-targeted EE programs be developed and incorporated into the IGP efforts by considering EE programs concurrent with the RFI step within the competitive procurement process as mentioned in feedback from Blue Planet ("BP"). [21] At the RFI step, the proposed EE programs could be initially screened against the competitive RFI responses. The programs considered most effective from a performance and cost perspective would be further developed. This would involve the Companies engaging Hawai'i Energy in the design of EE programs and measures to address specific grid needs (as defined through the IGP process). These grid needs would include both bulk system needs as well as locational needs, which could enhance the effective utilization of PBF dollars, maximizing system benefit for all customers.

Addressing feedback from the DCA, this process would help inform us of the best use of the Public Benefit Fund ("PBF") surcharge by aligning the achievement of EEPS (Energy Efficiency Portfolio Standards) goals with system needs. [22] An important element at this stage is to consider not only the services to be delivered through these programs, and the corresponding opportunities for and obligations of the customers, but moreover, the total targeted size of these programs. In this respect, program targets will need to be set, so that if during the screening process, programs are selected for advancement, the potential or targets set forth by these programs would need to be removed from the targets established for the competitive procurement. Absent of this step, the Companies could run the risk of over-procuring more services than would be needed by the system. The remaining system needs would be quantified and solicited through the competitive RFP.

A challenge in the first IGP planning cycle is the timing of the EEPS Potential Study report that is being conducted by Applied Energy Group (the EEPS and Public Benefits Fund Evaluation, Measurement & Verification Consultant) targeted to be available in the beginning of 2020. This means the IGP forecast being provided by January 2020 will not have the benefit of having the EEPS potential study incorporated. Furthermore, unlike in the past where EE metrics were more straightforward kWh reductions based, Hawaii Energy - in collaboration with the Companies - will need to develop a mapping between the EE programs proposed and the grid services identified within IGP. These issues – timing and attribution - will pose a challenge to fully consider the potential for new EE programs to address IGP resource needs that are slated to be identified by March 2020. The Companies will nonetheless engage Hawai'i Energy as part of the first IGP as described above.

The Companies believe this puts customers first in terms of value through better alignment between EE programs and system needs while offering an opportunity for all customers to directly participate; in the end, this helps all parties achieve state policy goals including EEPS targets while enabling customer diversity. [21, 22, 23] While in general these EE programs could reduce the potential need for solution procurements, it has the benefit of potentially reducing the incremental cost to all customers given that EE is already funded through the PBF surcharge.

Integrated Demand Side Management

As currently practiced, the Companies' Demand Response division will continue to collaborate with Hawai'i Energy to identify and demonstrate Integrated Demand Side Management ("IDSM") technologies and use cases. This work could foster Hawai'i Energy's ability to partner with third parties to propose IDSM options – above and beyond their EE measures – and bid these within the RFI and RFP competitive procurement channels. The potential synergistic benefits of IDSM are well documented and could enhance the value for customers.

As noted above, beyond the EE programs discussed herein, customers can otherwise participate in the delivery of energy and other grid services through a combination of Pricing and Procurement. The Companies may also consider launching direct-to-customer, utility-administered programs that utilize customer assets for the delivery of capacity and ancillary services (including distribution system services) once the competitive procurement process is complete. In this option the competitive procurement is prioritized, after which any system needs unmet by competitive providers would be available for utility-administered programs. In this option, programs would be motivated by the remaining service needs, but could target specific technologies, customer segments or locations. This also allows for collaborative IDSM programs to be developed and deployed in partnership with Hawai'i Energy; this creates an alternative should third party IDSM partnerships not succeed.

3.3.3 Competitive Procurements

Competitive procurements are the primary means of providing market-based solutions for the benefit of all customers. Additionally, it is essential that the procurement process be fair to all solution providers and all customers – participating or otherwise. There are three key aspects of competitive procurements that need to be addressed over 2019 and into 2020 to achieve the IGP objectives stated above.

These are:

- Standardized contract and corresponding set of service delivery requirements and obligations;
- Identified and defined grid services; and
- Streamlined competitive procurement process.

The sections that follow offer more details on each of these aspects of procurement.

3.3.3.1 Standard Contract & Participation Requirements and Obligations

The Companies will pursue the development of a standard contract(s) as the mechanism through which competitive procurement will be executed. At present, the Companies have employed both variable and firm PPAs and Grid Services Purchase Agreement ("GSPA"). The former is applied to engagements with IPPs, while the latter is applied to engagements

between the Companies and aggregators of customer assets. As the Companies pursue the standard contract ideal, we will examine each of these instruments as well as other contract forms in various jurisdictions.

The Standardized Contract Working Group (“SCWG”) is intended to determine the optimal approach to contracting for energy, capacity and ancillary services from a variety of sources. This Working Group will determine if a unified contracting approach can apply to all competitive procurement, or if multiple contract forms are required for different counter-parties. For illustration, the end result of these efforts could take one of two general forms: First, a simplified contract paired with participation rules documentation. In this case, the participation requirements and obligations documentation would serve as a repository for specific requirements beyond the legal terms and conditions, and offer flexibility across multiple suppliers or counter-parties. Second, heavily-loaded contracts that embed market rules within the contract. In this case, the concept of a single contract would likely give way to multiple contract forms that would be supplier-dependent.

Simplified contracting with consistent rules and service delivery requirements would support a streamlined procurement process. Contract consistency also facilitates the evaluation and optimization process for the range of energy, capacity, ancillary services, and transmission and distribution services. The identification and definition of these services and their associated delivery requirements are integral contribution to this effort; it not only allows for an apples-to-apples comparison of proposed solutions, but it also allows the Companies to stack solutions together additively in order to collectively meet targeted service quantities

3.3.3.2 Identified and Defined Grid Services

A wider range of grid services are needed as Hawai‘i decarbonizes the electricity sector with ultimately more than half its resources at the edge of the system. This shift has increasingly introduced significant variability into the individual islands’ power systems requiring greater flexibility to ensure safe reliable electric service. Increasingly, both utility-scale resources and DER have the potential to provide the flexibility needed. Already, DERs have the opportunity to provide flexible (ancillary services) related services.³⁰ Several bulk system ancillary services are available including frequency response, replacement reserves and regulation.

Going forward, a wider set of ancillary services and transmission and distribution non-wires alternatives services (e.g., capacity deferral) will be identified and defined through the process of documenting the T&D needs and ancillary services requirements. These services combined with energy services will provide the energy needed for Hawai‘i’s renewable goals efficiently and reliably, with appropriate resilience. These additional services, collectively referred to as “grid services,” will be defined as part of the Grid Services Working Group starting in early 2019.

³⁰ See Docket No. 2015-0412, Decision and Order No. 35238, issued on January 25, 2018.

3.3.3.3 Streamlined Resource Procurement (RFI and RFP)

The Companies envision seeking proposals for the identified resource and grid services needs through a streamlined procurement process that maintains confidentiality of bids to encourage brisk, competitive and innovative proposal submissions. The procurement process would be initiated with a RFI to seek preliminary proposals from market participants, followed by a RFP to seek binding proposals. The RFP process will be developed and refined as part of the Competitive Procurement Working Group ("CPWG").

To clarify, in response to feedback provided by the County of Hawai'i, the Companies are not seeking a waiver from the competitive bidding process altogether, but seek to improve and streamline the competitive procurement process based upon lessons learned from recent procurement efforts. [24] The goal is to encourage robust competition in Hawai'i, ensure a fair process for all, and provide the best outcomes for all customers. The Competitive Bidding Framework is ten years old and can benefit from updates to address current practice in the market and to speed the process to fit within the IGP process. The CPWG would work together with stakeholders to develop a new process that is efficient, competitive, and fair for all.

After resources and grid services have been determined, the Companies would initiate a two-step procurement process using standard, technology-neutral terms and agreements, as defined by the Companies with input from the other Market Working Groups. The first step is to open RFIs seeking grid resources such as renewable energy and capacity and grid services such as flexible load, fast-frequency response, regulating reserve, ramping capacity, and replacement capacity. Results screened from the RFIs would then be used to assess and identify transmission and distribution needs to integrate the proposed projects to the system. The transmission and distribution needs would be available for use by market participants to improve their projects or redefine it should the transmission and/or distribution needs be very extensive. In the second step, the Companies would then open an RFP, where market participants are able to provide firm, binding proposals that will be evaluated against all proposals.

Prior to initiating the RFI, the Companies would work to identify land resources that are available for the development of grid scale renewable energy projects, similar to the Land RFI process that was completed in 2017.³¹ Information from this RFI would then become available to developers who are willing to enter into Non-Disclosure Agreements with the Companies. Alternatively, information from the land RFI could be used by the Companies to identify and lease or purchase properties that could then subsequently be offered as part of the RFP for development of a renewable energy project. This could greatly simplify and enhance the overall competitiveness of the procurement process. The Consumer Advocate also recognized that the ability to keep competitively sensitive information provided in the RFI and RFP as confidential would be beneficial to the solution sourcing. [33]

³¹ See Hawaiian Electric Companies, *Land Request for Information*, available at <https://www.hawaiianelectric.com/clean-energy-hawaii/selling-power-to-the-utility/land-rfi>.

Additionally, to ensure effective participation by aggregators, the Companies envision a process building upon and incorporating lessons learned from the process used to develop the current Demand Response portfolio and select aggregators that can supply the needed services. The opportunities for aggregators will evolve as the Companies continue to define additional services as part of a procurement process.

HPVC also suggested a California DPAG³² type of group to advise the Companies “on selection of distribution deferral opportunities and providing input on the development of competitive solicitation for DERs”.^[14] As described, the integrated planning process will identify the resource, ancillary services, transmission and distribution needs for input into all-source competitive procurements with Commission, Consumer Advocate, Stakeholder Council and public review. This is a significantly greater opportunity for DER in Hawai‘i to provide services than afforded in any other state.

The IGP solution sourcing process timeline is provided in Figure 7 below. The RFI is targeted to be issued after the identification of resource needs is completed around March 2020. The results of the RFI are expected by July 2020. Then the T&D needs for the resources in the RFI will be defined from August 2020 to October 2020. The resource RFP would subsequently be issued from October 2020 and expected to end by March 2021. The T&D solution sourcing would also occur from October 2020 to March 2021. At the end of the RFP and T&D solution sourcing, a selection of final short listed projects will be made and then such projects will be further evaluated in the Solution Evaluation and Optimization phase described in Section 3.4.

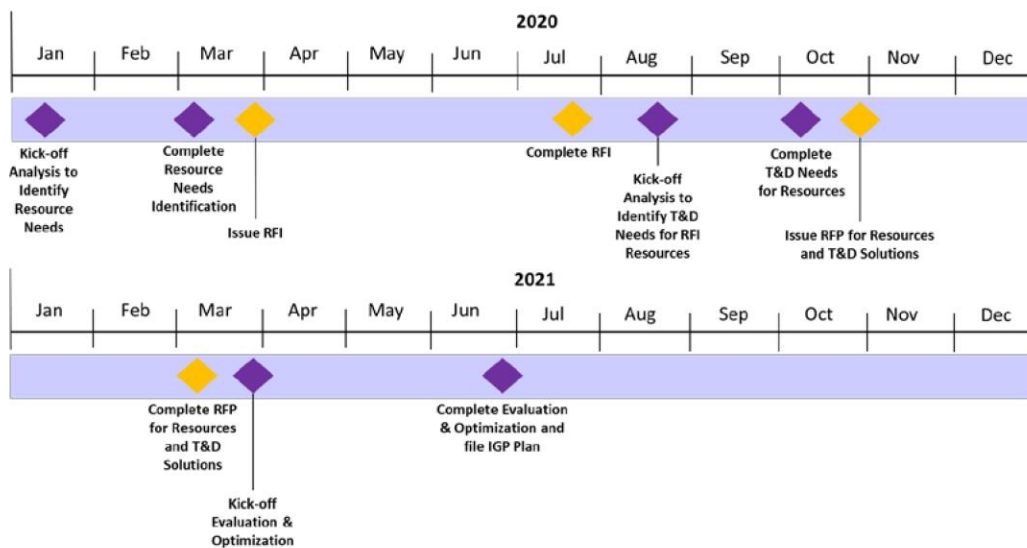


Figure 7: Solution Sourcing Process Timeline

As noted above, the Companies will continue to work to determine the most prudent prioritization and sequencing of Programs, Procurement, and Pricing for sourcing resources.

³² California PUC, Decision Addressing Competitive Solicitation Framework, December 2016, IDER Proceeding D.1612036.

3.3.4 Utility Resource Development

This category of resources option involves the utility providing self-build options to meet resource needs. This also includes developing options for unique resource needs or providing critical services that can be justifiably best provided by the utility. For example, the Schofield Generating Station was constructed to provide backup service to the Army to meet its national security mission. This may also involve options to address critical system reliability (or system security) services that augment what the market may not provide to satisfy the need.

3.3.5 IGP Soft Launch

The Companies believe there is an opportunity to accelerate the learning associated with this sourcing process, particularly with distribution non-wires alternatives services. A soft launch of the sourcing process will help inform development of the full scale IGP planning and sourcing effort beginning in 2020. Specifically, this IGP Soft Launch is intended to demonstrate the sourcing processes and evaluation methods for distribution non-wires alternatives in 2019. The identified need for the Soft Launch is an O'ahu distribution substation capacity upgrade to serve a new housing and commercial development by 2023. The Companies intend to source solutions to defer the need to expand the distribution system capacity to serve the expected load growth. Walking through the soft launch project will provide real-world experience associated with "the identification of needs for a resource choice like aggregated DER because of locational impacts of DER", a comment shared by the County of Hawai'i. This process will also work to address concerns with transparency and access to information among the working groups. [16]

Preliminary distribution planning analysis, shown in Figure 8 below, identified multiple normal and contingency scenarios that must be mitigated in this area. For example, this includes the need to address a peak overload of up to 4 MVA for 6 hours duration under normal conditions. Also, a need to address a peak overload of up to 5.4 MVA for 11 hours duration under contingency conditions. NWA services must be operational by 2023 or additional substation capacity will need to be built.

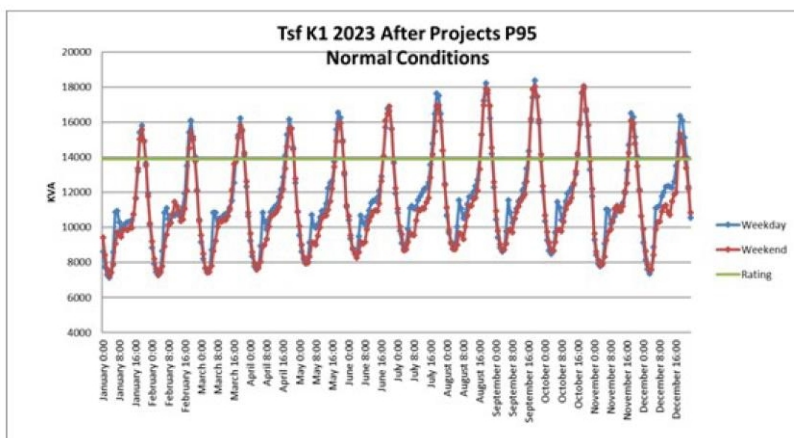


Figure 8: Distribution Substation Transformer Forecast Loading

The Companies propose to initiate the Soft Launch in January 2019 commencing with sourcing and evaluation in 2019 and continue with anticipated solution deployment in 2020-21 and operational testing by 2022. Soft Launch will be informed by and provide learnings to Market Working Groups activities. The preliminary schedule of Soft Launch activities is shown in Figure 9, below. Additional information on the Soft Launch, including additional details on the distribution need, will be provided at the public kick-off in January.

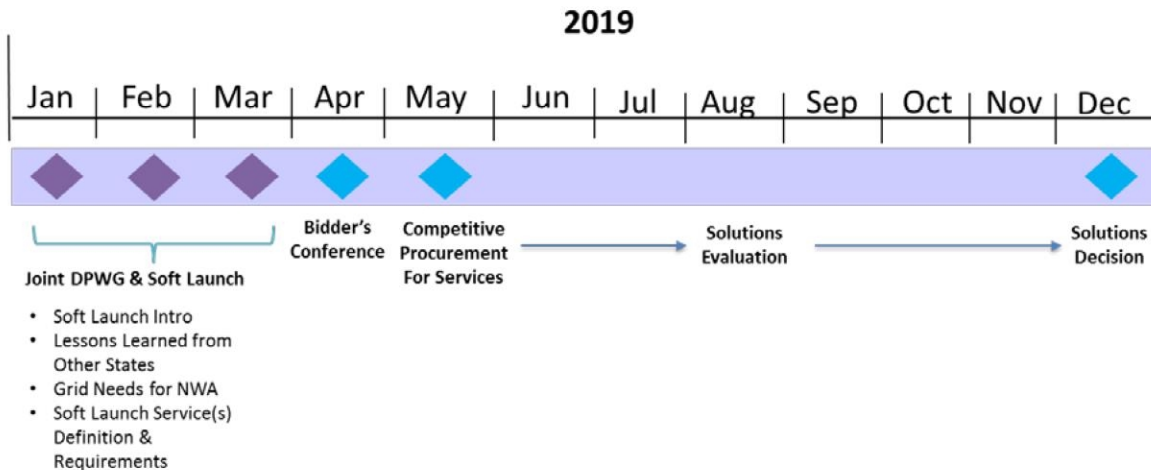


Figure 9: IGP Soft Launch Schedule

3.4 SOLUTION EVALUATION & OPTIMIZATION

The IGP process, as described above, will include identification of near-term incremental resource, transmission, and distribution net system needs. These incremental needs (defined in a technology-neutral manner) will then become the basis for identifying potential resource and grid alternatives through an inclusive and integrated sourcing process. The resulting alternatives will be evaluated through a unified valuation approach to yield optimized cost-effective solutions for customers in the near-term action plan.³³ This is intended to address the Commission's objective as described in the DR Decision and Order:

*The absence of such unified valuation has the real potential to create market inefficiencies and inconsistent assessment of resource selection.*³⁴

The complexity of this evaluation involves the selection of resources to fulfill the requirements based upon the most cost effective way to meet all of the services needed on a combined

³³ The process for evaluating the solutions proposed through the RFP and T&D solution sourcing is described in Section B.4.1 of the IGP Report.

³⁴ See Docket No. 2015-0412, Decision and Order No. 35238, issued on January 25, 2018, at 96.

basis. Selecting solutions based on the lowest cost for each, in contrast, may result in over-procuring services. As such, developing the solution evaluation and optimization process will need to address five key aspects in an integrated manner:

- Evaluate the technical fit of proposed program and procurement solutions to the identified resource/grid needs on a technology neutral basis;
- Assess the cost-effectiveness of various alternatives to ensure reasonable portfolio cost;
- Analyze the comparative values of the proposed solutions on an apples-to-apples basis;
- Evaluate combinations of solutions to satisfy an identified need, including if partial solutions are allowed; and
- Assess the synergistic value of solution(s) to address multiple needs identified.

It is anticipated that the resulting IGP evaluation approach will build on the existing valuation methods for discrete solutions employed in the PSIP and for DR as highlighted below. Challenges arise with assessing a diverse portfolio of non-uniform solutions and identifying synergistic value as the level of complexity increases significantly. It is important to recognize that this type of unified valuation and optimization analysis have not been done in the industry collectively for resource, transmission and distribution solutions. The discussion with stakeholders through the Solution Evaluation and Optimization Working Group (“SEOWG”) will involve identifying reasonable goals for what can reasonably be achieved in the first IGP cycle – that is, what is “good” as opposed to perfect. The Companies also anticipate leveraging the TAP and other industry experts to solicit ideas and feedback on methods and tools to perform the evaluations.

The following is offered to highlight how selected current evaluation methods may be adapted for this new process. Note that these are not the only components anticipated that will be needed to complete a unified approach. Therefore, this is not a comprehensive discussion of the optimized evaluation methods and process that will be initially developed through working group discussions over the coming year and refined in subsequent IGP cycles.

The Companies anticipate, for example, that all resource, ancillary services, transmission and distribution solutions will need to be first vetted for technical efficacy – that is, do they satisfy the technical requirements of the identified need(s). From these technical screens, the initial cost effectiveness analysis may be performed.

The value of service methodology, described below, is useful to estimate avoided cost for capacity, energy and ancillary services and provide a cost reference for grid needs identified in the IGP process. Value of service can also be used as a first, economic-level screen when evaluating multiple solution proposals. Ideally, the fixed or levelized cost of a solution should be less than the sum of the value of service for all grid services provided by a solution. As noted by stakeholders such as LOL, DBEDT, and County of Hawai‘i, the “value to ratepayers” and “contribution to the RPS targets and reductions in greenhouse gas emissions” are

important principles to also consider in determining the value of grid services that will be discussed in the Solution Evaluation and Optimization Working Group. [6, 7, 8, 9, 29, 53]

For example, the value of service for capacity and regulating reserve will be defined for multiple capacity increments – e.g., for a 1 MW, 20 MW, and 50 MW proxy resource. A similar process would be used for energy assuming a fixed capacity for the proxy resource – e.g., a 20 MW proxy resource will be evaluated with available energy up to 10 GWh, 50 GWh, and 100 GWh. A combination of the capacities and energies mentioned previously will be used to determine the value of service for a time-of-use, load shifting service. For the time-of-use load shifting, three periods will be analyzed: nighttime peak, daytime off-peak, and nighttime off-peak.

The avoided cost, value of service analyses will be performed in PLEXOS by comparing a production simulation run with and without the proxy service resource. The difference in annual resource plan cost with and without the proxy service resource will be divided by the total energy supplied or total capacity provisioned in the PLEXOS model for each grid service at each proxy resource increment. The value of service will be used in the solution evaluation phase of the IGP as reference points for cost effectiveness when evaluating multiple solution proposals.

The avoided cost for transmission and distribution needs will be based on the lowest estimated cost of the associated best fit engineered T&D “wires” alternative. This lowest reasonable cost “wires” alternative will provide an initial economic reference. After which, the combined proposals will be evaluated to determine the total integrated costs of the various solutions. These costs will be evaluated in the RESOLVE and PLEXOS models to develop the portfolio of solutions to address resource, transmission, and distribution needs optimized around costs and objectives. As the Consumer Advocate noted, the VoS methodology and its underlying assumptions will benefit from further refinement. [27]

The integrated evaluation and optimization will involve additional sophistication to normalize the solutions for apples-to-apples comparison and assessment of synergistic “twofer” value potential. This will involve iterations of production model based analysis along with T&D engineering analysis to arrive at the final portfolio. This aspect of the evaluation process, in particular, is a work in progress and will be developed through 2019.

The total integrated costs based on market and other solutions will replace the resource costs assumptions used in the first analysis identifying the resource needs in the five year period. Although the procurement of resources covers the first five years of the planning horizon, it is likely that proposals (e.g., grid-scale resources) will extend beyond the five years; therefore, the evaluation of the proposals may need to cover a period longer than the initial five years, which is why the initial planning analysis that identified the system needs provided the long-term view out to at least 2045. The resulting optimized portfolio of solutions that provides the lowest cost and meets the system needs identified in the 5 Year Action Plan should ensure customer value. This enhancement to prior resource planning efforts includes fully integrated project and solution costs in the 5 Year Action Plan in lieu of proxy costs.

The evaluation and optimization process is targeted to occur from March 2021 to June 2021. Upon completion of the evaluation and optimization process, the Companies will file the 5-Year IGP Plan with the Commission and enter into contract negotiations of the pre-approved standardized contracts as appropriate for selected projects. The final negotiated contract(s) and project applications will then be submitted to the Commission for approval.

3.4.I List of Issues to be Resolved

The following issues will need to be addressed in the Solution Evaluation and Optimization Working Group.

- 1) Evaluation of solutions that have non-uniform contract term lengths and in-service dates
- 2) Evaluation of solutions that may meet only a portion of the defined grid needs
- 3) Assessment of the synergistic benefits provided by a combination of solutions that would otherwise not be provided by an individual solution
- 4) Consideration of RPS contributions and reductions in GHG emissions in the solution evaluation

3.5 IGP LONG-TERM PLAN AND FLEXIBILITY

The portfolio of solutions in the 5-Year IGP Plan will then replace the initial system needs as fixed assumptions and the resource plan re-optimized through RESOLVE. This step will rebalance the resources in the long-term pathway beyond the 5-Year IGP Plan so that the impact of the market-sourced solutions on the resource plan can be understood. The long-term pathway provides a vision of the safe, secure, reliable, and resilient grid coalesced with Hawai'i's natural resources. This description addresses the concern raised by Blue Planet: "If the short term instead becomes the foundation or drive for planning, this may result in an incrementalist approach that loses focus on the longer-term direction." [3] As noted by the Commission in its PSIP D&O, the purpose of integrated system planning is to determine a reasonable plan that can serve as a strategic basis and provide context to inform resource acquisition, incremental grid investments, alternatives, and system operation decisions.³⁵ The Commission further stated that "well-vetted, credible, comprehensive system analysis is essential to the HECO Companies fulfilling their role to provide a platform to meet the diverse service requirements of their customers by integrating a variety of generation sources and customer-sited resources in an economically and operationally efficient manner."³⁶ The IGP is designed to do exactly that.

³⁵ See PSIP D&O, at 24.

³⁶ See PSIP D&O, at 24.

Similar to the PSIP process, the long term system needs provide pathways to achieving 100% renewable energy by 2045, from which the short-term, five year plan is developed. DBEDT comments that “infrastructure solutions to address barriers to reaching 40% renewable energy [by year 2030 on Oahu] could easily have lead times in excess of a decade.” [18] The Companies agree that long lead time infrastructure and resources should be identified in the IGP process. As shown in Figure 10 below and described in Section B.4.2 of the IGP Report, the IGP would still provide the long-term view and not just the five year action plan. This will be further elaborated in the IGP Workplan.

The long-term pathway will provide the strategic context to guide discussions in the continuous IGP cycles as the Companies transform to the 100 percent renewable energy future. It is expected that as the vision becomes reality, discussions in the IGP process will continue to evolve and tackle challenging topics, including resiliency policy objectives, how energy planning can spur economic development of smarter cities and communities through the electrification of other sectors (e.g., transportation), optimal land use, and job creation. The Companies believe that IGP is the best mechanism to build a common understanding of the challenges, opportunities, and tradeoffs involved with enhancing the electric grid to meet customer service expectations and achieve the state’s renewable goals.

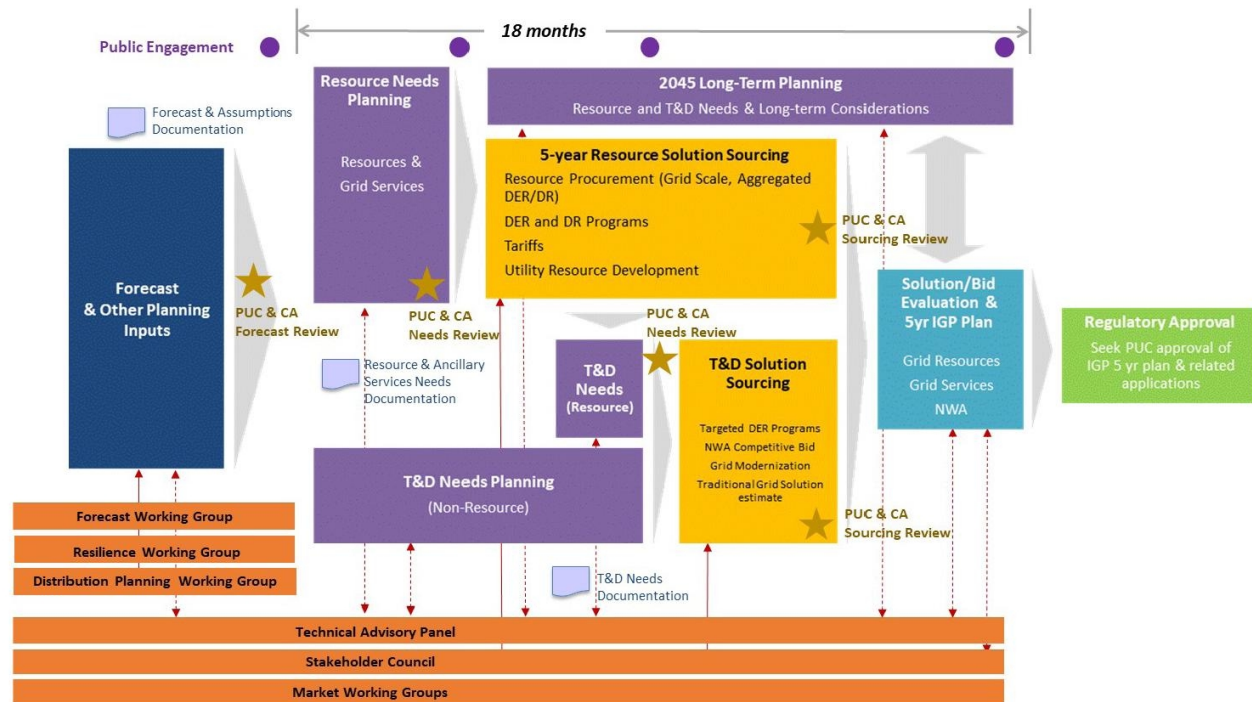


Figure 10: IGP Process Diagram with Review Points

Figure 10 shows the overall process, interim documentation and anticipated points for stakeholder engagement during the process. The stakeholder engagement proposed in the IGP process provides meaningful outreach and transparency without the need for specific “independent oversight and evaluation.” Stakeholder engagement will be utilized in the development of forecast assumptions and scenarios and in the review of analytical results. The

Working Groups and TAP will contribute to determining if and where any additional midstream evaluations and corrections should occur. The process steps in the diagram above designated with a star are process points where the Companies anticipate discussions to occur with stakeholders and specifically with Commission staff and the Consumer Advocate. These are opportunities for midstream evaluation and potential course correction which include the identification of resource and T&D needs, as well as solution source results.

4 Stakeholder Engagement

The Companies have engaged and will continue to engage with customers and stakeholders to seek input and feedback on the IGP development and subsequent planning and sourcing. As proposed by the Companies and noted by stakeholders, the IGP process must be customer-centric and engage stakeholders to broadly represent the interests of Hawai'i's various communities. This involves actively engaging customers and communities throughout this process to ensure balanced representation. Enabling transparent stakeholder engagement, which balances inclusiveness with efficiency, while remaining focused on value for customers, is a theme also emphasized by stakeholders, such as BP. [5]

The Companies are committed to active customer and stakeholder engagement throughout the IGP process, building on the model adopted for the 2016 PSIP and the 2017 GMS. Given that stakeholder engagement is a critical and integral aspect of the planning and sourcing process, it is understandable that stakeholders requested greater clarity regarding the roles, scope and interactions of the various proposed advisory and working groups. Additionally, there is a need for more details on how the IGP process will include public outreach and transparency. The following discussion of the stakeholder engagement model seeks to address the stakeholder comments received.

4.1 ENGAGEMENT MODEL

This summer, the Companies launched the IGP stakeholder engagement model, as shown in Figure 11 below, including the initial Stakeholder Council meeting and a public workshop on September 25th. The Technical Advisory Panel was also formed and held two meetings. The overall IGP stakeholder engagement model provides a robust framework that enables the Companies to engage with stakeholders and customers to gather their input and feedback throughout the IGP process and leverage global insights on emerging best planning practices in a systematic manner. Consistent with our previously discussed plans and Commission direction, the Companies are establishing independent facilitation to enable stakeholders and customers to effectively share their input and feedback and provide a balanced, respectful discussion among all stakeholders throughout the IGP process. In this way, the stakeholder engagement process maintains fairness and openness for sharing ideas; a requirement as commented by BP. [5]

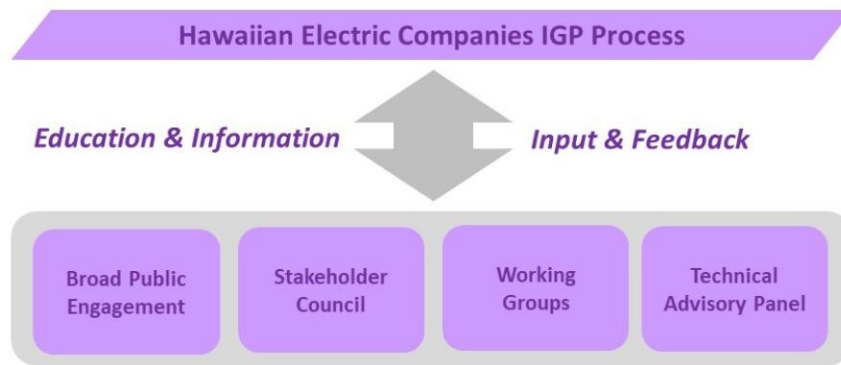


Figure 11: Stakeholder Engagement Model

This stakeholder engagement framework is intended to provide ongoing customer and stakeholder engagement through both public outreach and several stakeholder engagement groups. The stakeholder engagement groups principally include the Stakeholder Council and technical working groups. Additionally, the Companies have formed an independent Technical Advisory Panel of industry experts in power system planning to act as a sounding board on technical issues given the several leading edge aspects of the IGP planning and sourcing. The Companies anticipate launching the initial working groups in the beginning of 2019.

Broad public engagement in the development and implementation of IGP is essential. The Companies held the first public IGP symposium in November 2017 as part of the development of the IGP Report. This was followed by a public workshop to discuss the filed IGP Report, held on September 25, 2018. The Companies are planning another public workshop in early 2019 to review and solicit feedback on this Workplan, in conjunction with another educational symposium. We expect to conduct public outreach more frequently beginning in 2019 as IGP development efforts begin.

The Stakeholder Council is a key element of the overall IGP stakeholder engagement process. The SC is intended to be a standing group to provide strategic input and feedback on IGP process development, activities and results, and aspects for improvement. This includes providing input on issues to consider in the planning process, such as resiliency, as noted by several stakeholders in comments provided. In addition, the SC will help identify issues that may benefit from forming technical working groups to address as well as reviewing the results of working group activity. SC members may also have technical questions to pose to the Technical Advisory Panel through its chair, who is also a member of the SC. The Companies and their facilitators will also help support the exchange of information to ensure discussions are well-documented and transferrable.

IGP involves several aspects that will involve process changes, enhancements and new methods. These improvements involve technical aspects that will benefit from stakeholder education, input and feedback. As such, Working Group(s) ("WG") will be formed on an as-needed basis to address specific topics in an advisory only capacity and not as a decision-making group. Working Group(s) will be stood down upon completion of the work task related to their input and contributions involving their subject-matter expertise. In an effort to create

an efficient and positive group dynamic, participation in a Working Group will ideally be comprised of subject matter experts or knowledgeable members in the topic area. Equally important is membership with the capacity to dedicate sufficient time to support the timely completion of the WG's scope of work. Further, one or more Working Groups will involve topics that are part of or related to other Commission proceedings, such as the DR docket. Every effort will be made to integrate or at least coordinate the Working Group and/or IGP activity with those associated proceedings. Based on the feedback from stakeholders and IGP development needs, the following working groups will be initiated in 2019:

- Forecast Assumptions WG to support development of forecast assumptions and sensitivities as part of the pre-IGP planning cycle activity;
- Resilience WG to support the development of resilience planning criteria for Hawai'i's power system including resource, transmission and distribution in relation to potential societal and economic impacts;
- Distribution Planning WG to support enhancements to the methods and tools for distribution planning and the integration with resource and transmission planning; and
- Market WG comprised of four interrelated subgroups³⁷ to support development of the sourcing and evaluation steps in the IGP process:
 - *Standardized Contract WG* beginning with the Grid Services Purchase Agreement (GSPA) and the Companies' Model Renewable Dispatchable Generation PPA and Model Firm PPA.
 - *Grid Services WG* to identify and define additional energy, capacity, ancillary and non-wires services.
 - *Solution Evaluation and Optimization WG* focused on the methods for evaluating and optimizing multiple solutions for multiple grid services.
 - *Competitive Procurement WG* to identify proposed changes to the Commission's Framework for Competitive Bidding³⁸ to reduce barriers to market participation and enable integration with the IGP.

As the Commission described, "potential intervenors or participants must be prepared to address these [IGP] issues in depth."³⁹ The Commission also noted that stakeholders or stakeholders' consultants that possess engineering, economic, and policy expertise with respect to planning issues, would be very beneficial for the technical discussions associated with IGP. However, working group composition will strive to engage representation from every significant stakeholder group, and meeting summaries will be accessible to all interested stakeholders.

HPVC recommended that an all-encompassing planning working group whose review includes all aspects of integrated planning, similar to the California DPAG. [46] The Companies agree

³⁷ The Market Working Group reference is used to represent the four subgroups' interrelated activity and will not involve another separate group.

³⁸ See Docket No. 03-0372, Decision and Order No. 23121, issued on December 8, 2006, at Exhibit A.

³⁹ See Docket No. 2018-0165, Order No. 35569 *Instituting a Proceeding to Investigate Integrated Grid Planning*, issued on July 12, 2018, at 29.

that an all-encompassing stakeholder engagement process be employed and have proposed such an approach as described. The Stakeholder Council and public engagement effectively provide an all-encompassing opportunity for stakeholder input and review.

The California DPAG was proposed to address the need for a level of transparency and technical peer review during distribution planning and sourcing that the Stakeholder Council currently provides. However, unlike the Stakeholder Council, the California DPAG doesn't oversee all forecasting, resource and transmission planning, or the related sourcing. There are separate stakeholder groups and working groups for each of those without any overarching stakeholder engagement process.

Additionally, the California DPAG was not the working group that developed the process and methods for Distribution Resource Planning ("DRP") and Integrated Distributed Energy Resources ("IDER") sourcing, those were done through multiple technical working groups that preceded the DPAG.⁴⁰ As such, there wasn't an all-encompassing stakeholder working group engaged in the development of integrated distribution planning and sourcing in California under the IDER and DRP proceedings.

The Companies believe a better model to address both the all-encompassing input and review and the need for detailed technical process development is the New York Reforming the Energy Vision ("NY REV") stakeholder engagement model which the Companies have adapted. The New York stakeholder engagement model which NY REV has been using for three years now, combines a strategic level stakeholder group (advisory group) to provide input and review of all aspects of the distribution system platform development and planning, plus technical working groups (engagement groups) on selected topics. This structure enables a comprehensive engagement for review and input, plus the opportunity for stakeholders to be involved in the development of the IGP process as a more tactical level. It is necessary in the development of the IGP process to form working groups that can address specific technical and process issues that are beyond a single group's ability to address. This has been the case in California with the several IDER and DRP working groups that preceded the California DPAG, as well as in New York.

Consistent with the working group charters and plans described in this Workplan, an overall working group meeting plan and schedule will be established. The meeting schedule will involve in-person meetings and webinar sessions that occur frequently. All in-person working group meetings will also have webinar access to enable greater transparency. The Companies will work with the independent facilitator and working group facilitators to coordinate working group schedules to enable stakeholder participation.

The Technical Advisory Panel is an independent industry advisory group, chaired by Rick Rocheleau of the Hawai'i Natural Energy Institute ("HNEI"), that acts as a sounding board for

the IGP team on technical issues. The TAP will not conduct any planning analysis and will not be involved in the evaluation of any solution development or procurement. TAP's purpose is to provide the Companies with insights into leading engineering practices globally to support development of advanced methods and evolving specialized tools that are unique to the IGP process. This type of peer advisory group is not uncommon in the industry as utilities increasingly pursue more sophisticated technical analysis.

This stakeholder engagement model is designed to foster a high degree of interaction among these three elements facilitated by both the Companies and interlocking participants. As stakeholders (DCA and COH) have commented, it is essential that this engagement process not result in siloed activities given the number of concurrent and interrelated activities. Figure below illustrates and describes the interactive information exchange and coordination expected with this approach similar to the successful engagement model employed in New York by the joint utilities⁴¹ under the NY REV effort over the past three years. [34, 35, 36, 38, 43]

Stakeholder Engagement Structure & Information Sharing

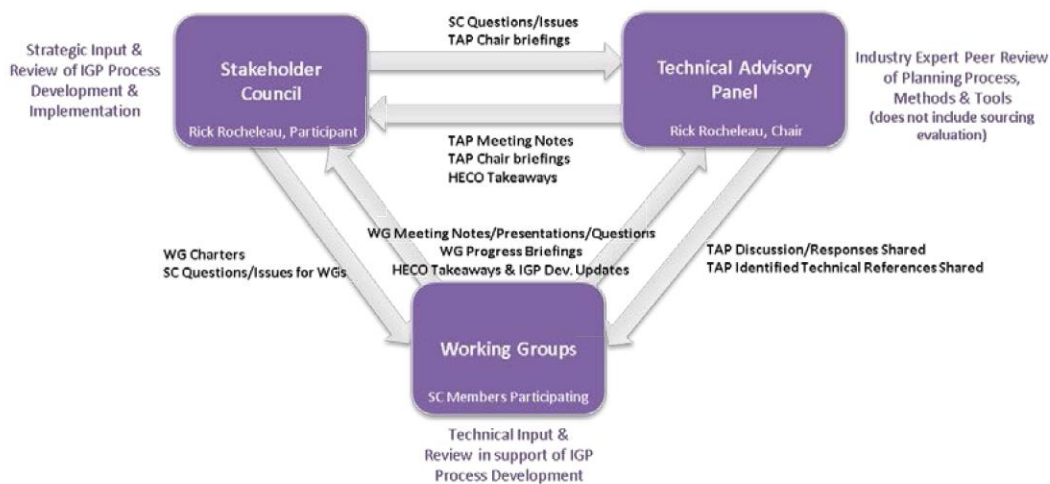


Figure 12: Stakeholder Engagement Structure & Information Sharing

Transparency and effective stakeholder engagement are key success factors for IGP. As stakeholders have commented, transparency through public information sharing and independently facilitated participation through public workshops, Working Groups and representation on the Stakeholder Council is needed. The Companies are committed to ensuring the effectiveness of overall transparency and broad customer and stakeholder engagement.

⁴¹ Joint Utilities of New York are the four investor-owned utility corporations that are jointly conducting stakeholder engagement on related issues. The public website for their stakeholder engagement is: <https://jointutilitiesofny.org/home/>.

4.2 INFORMATION SHARING

The Companies have launched a public IGP website to share information on IGP development activities, related educational materials including videos, and information on public workshops, the Stakeholder Council, Working Groups, and the Technical Advisory Panel. The information for these activities will include schedules, meeting agendas, presentations (by the Companies, stakeholders and experts), and meeting summaries. Public workshops and symposiums may also be video recorded with links provided on the website for later viewing, as has been done for prior IGP related events. The website will also include IGP contact information for the public to seek information and provide direct feedback to the Companies. [37]

As IGP process development matures over 2019 and into 2020, it is anticipated that various documentation of new processes and methods will also be shared with the public and various engagement groups (Figure 10) and will also be posted to the IGP website. Further, as the forecasting assumptions are developed in 2019 and subsequent planning analysis begins in 2020, the results of these activities will be shared publicly with stakeholders for review consistent with the proposal in the IGP Report. [30, 31, 32, 39, 40] These documents and working group work products will also be posted to the IGP website.⁴²

The public are free to access and download any materials available on the website. This method of sharing information based on industry best practices in New York and California addresses comments expressed by a number of stakeholders (Hawaii PV Coalition, Life of the Land, County of Hawai'i) with regards to the need for sharing all relevant technical details that goes into all points of the planning process and the underlying assumptions.

4.3 FACILITATION

The Companies have designed an approach to address the unique needs and issues of each of the elements: Public Engagement, Stakeholder Council, Working Groups and Technical Advisory Panel. We recognize the quality of customer and stakeholder engagement is predicated on effective facilitation and continuing investment in customer and stakeholder education. As such, the Companies will work closely with the selected facilitators and Technical Advisory Panel chair to ensure coordination of the various groups' meeting and topics, public dissemination of information, and provide overall quality assurance.

⁴² This is also consistent with best practice in California, see *The California IDER and DRP Working Groups* website, available at <https://drpwg.org/>.

Public Engagement & Stakeholder Council

Hawaiian Electric has retained Strategies 360 (“S360”) to provide independent facilitation services for public engagement and the IGP Stakeholder Council. As an independent facilitator, S360’s role is to enable public workshops and Stakeholder Council meetings to achieve common understanding from which all individuals feel empowered to contribute. The facilitator will build a rapport and keep stakeholders focused throughout the process. The facilitator will ensure that the dynamics of the represented communities are captured and shared in facilitation notes that will be distributed publicly.

S360 Vice President of Communications Donalyn Dela Cruz will serve as the facilitator. Ms. Dela Cruz’s extensive experience in facilitating multi-stakeholder engagement events speak to her knowledge and credibility in the industry and community. Ms. Dela Cruz’s community engagement skills will ensure that the Council is aligned with customer and stakeholder interests and facilitates the development of the IGP process and subsequent plans.

Through effective facilitation of the public workshops and SC meetings, the facilitator will work with the Companies and stakeholders to draw out input and feedback on the IGP process development, activities and results, and aspects for improvement. As shared by the SC members at the initial meeting on August 30, 2018, it is essential that a collegial, balanced discussion is fostered in order to achieve greater shared understanding of issues to address in the IGP process and results, and to build toward common ground through iterative discussion and feedback. Additionally, S360 will provide a designated note taker for each public workshop and SC meeting to ensure that notes are accurately recorded consistent with Chatham House rules.⁴³ The Chatham House Rules state, “Participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant may be revealed”. This means that participants will not disclose who said what in the meetings and the meeting summaries will not attribute comments to anyone. In the case of SC meetings, meeting notes will be reviewed by SC members for accuracy and posted online on the IGP webpage to enhance public transparency. Public workshop webinar videos/summary notes will also be posted online.

Working Group Facilitation

A challenge for the technical working groups is that the issues to discuss are at the vanguard of integrated power system planning and sourcing in the United States. The working groups will be considering, “detailed analysis and discussion of various technical, economic, and policy issues” and the facilitation will need to support these, “highly complex and technical” conversations.⁴⁴ As noted by the Commission in prior guidance, this requires sufficiently knowledgeable and credible working group facilitators that are able to assist stakeholders in productively discussing and sharing technical issues. Therefore, the Companies are engaging

⁴³ See Chatham House, *Chatham House Rule*, available at <https://www.chathamhouse.org/chatham-house-rule>.

⁴⁴ Order No. 35569, at 29.

respected consultants with requisite subject matter expertise and prior experience in California, New York and other states that demonstrate their ability to exercise the independence that is necessary for this type of engagement. The selected consultants have all worked together over the past several years as working group facilitators.

The working group facilitators are:

Paul De Martini, Newport Consulting (Forecasting Assumptions, Distribution Planning, and Grid Services) is a leading consultant to utilities, regulators and energy services firms globally. He has organized and led the stakeholder engagement in both California and New York related to forecasting, integrated distribution planning and utilization of DER for non-wires alternatives. Mr. De Martini is also currently the co-lead for the U.S. Department of Energy's modern distribution grid initiative and a principle contributor to the NARUC-NAESO Integrated System Planning initiative. He was a member of the National Academies of Sciences T&D Reliability and Resilience Committee (2016-17).

Dale Murdock, Newport Consulting (Evaluation and Optimization, Procurement Streamlining) has a deep background in electric industry resource planning, procurement, portfolio management and operations for large scale and distributed resources. He provides consulting to utilities, competitive energy services firms and community choice aggregators. He has extensive experience facilitating relevant working groups in California and New York over the past four years. Mr. Murdock was previously Senior Vice President of Energy Supply and Structuring at PG&E Energy Services, a competitive integrated energy services affiliate of PG&E. Prior to that, he served as Director, Power Generation Fuels and Planning at PG&E.

Laura Manz, Navigant (Standardized Contracts) is a nationally recognized leader in the energy industry with experience in electric and gas utilities, electric transmission, wholesale power markets, smart grid and distributed energy resources. She has expertise in power generation, electric transmission, grid operations, renewable and DER integration and procurements drawing on her prior work experience in wholesale electricity markets for the Mid-Atlantic states (PJM), California, and Texas (ERCOT). Ms. Manz has facilitated related working groups in California and New York.

The working groups will be designed to accomplish as much as possible within the allotted timeframe, while respecting the time and resource constraints of all stakeholders. The working group facilitators will distribute preparatory materials provided in advance of meetings to frame key issues to ensure that stakeholder time is respected and leveraged as much as possible. It is anticipated that stakeholders may also provide discussion materials on certain topics as part of the working group dialog. Materials shared in the working groups, including stakeholder presentations and meeting summaries will be posted online on the IGP webpage.

Although retained and compensated by the Companies, the consultants will be responsive to all stakeholders and be directed to demonstrate independence in facilitating the engagement.

Further, Paul De Martini will also provide oversight of all the working group facilitators for assurance that the desired level of engagement is achieved.

Technical Advisory Panel

The TAP is chaired by Rick Rocheleau, executive director of HNEI. The Chair is responsible for facilitating the TAP meetings including setting meeting agendas based on member input and technical issues raised by stakeholders and the Companies. The Chair is supported by John Cole of HNEI and a senior representative of the Companies.

4.4 STAKEHOLDER ENGAGEMENT SCHEDULE

An overview of the various stakeholder meetings planned for 2019 thru the first half of 2020 is provided in Figure 13 below. As mentioned previously and discussed in more detail in Section 5, stakeholders will need to actively participate in working group meetings due to the brisk schedule of many working groups and wide breadth of topics to be covered.

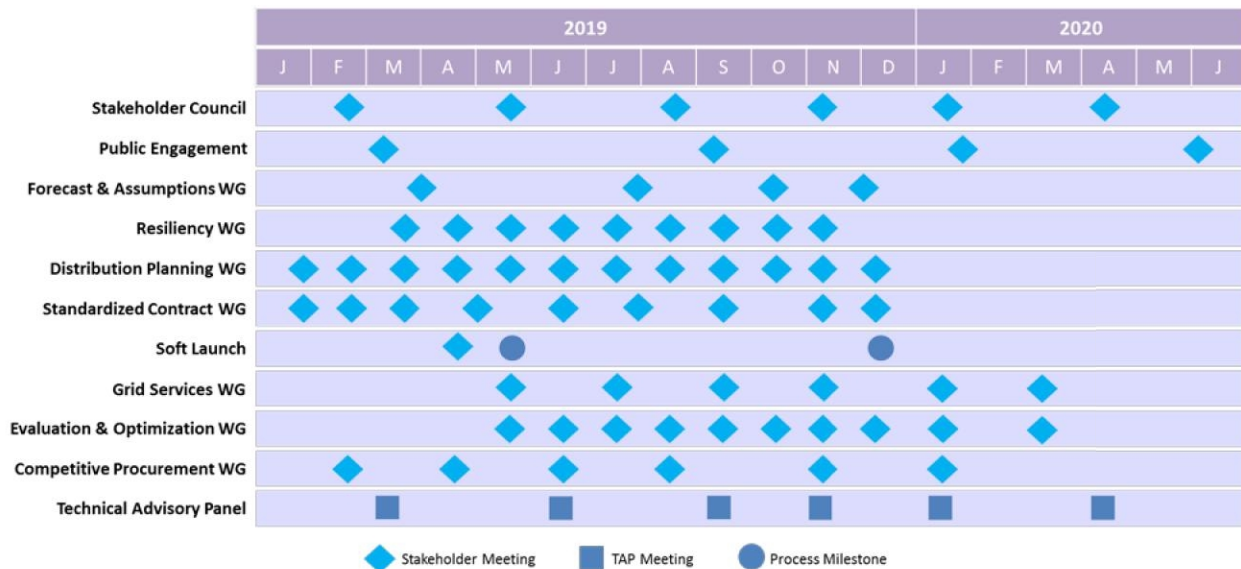


Figure 13: Stakeholder Engagement Schedule 2019 – 2Q 2020

5 Stakeholder Engagement Charters

As requested by the Commission, the following describes the parameters of each element of the IGP stakeholder engagement and associated schedules. The schedules are directional and the exact schedules will be developed in consultation with participating stakeholders.

5.1 STAKEHOLDER COUNCIL

Objectives

The IGP Stakeholder Council represents our customers and other broad stakeholder interests in Hawai'i. The Council is a key element of and one of several stakeholder groups in the overall stakeholder engagement process essential for IGP success.

The Stakeholder Council helps ensure alignment of Hawaiian Electric's grid plans with customer and stakeholder interests and facilitates the development of broadly supportive action plans.

The Stakeholder Council will provide strategic input and feedback on IGP process development, activities and results, and aspects for improvement. There will be discussions of priority issues that may benefit from a subject matter expert-based working group to address tactical and technical issues. Throughout this process the aim is to foster collegial, balanced discussions to achieve shared understanding of issues to address in IGP and planning results, and to build common ground through iterative discussion and feedback.

Meeting materials will be sent to SC members for review in advance of each meeting. Only public information will be shared at the meeting so that participants are free to use materials as desired with their communities.

Role and Responsibilities

Stakeholder Council members are expected to be ambassadors for their respective stakeholder communities, representing their interests by providing input and disseminating information. The SC is an advisory group, not a decision-making body.

Members must be willing to commit to meeting in-person on the SC for a full two-year IGP planning cycle. Online participation will be accepted on a limited basis. Members should be prepared to contribute to achieving the meeting goals by sharing ideas, asking questions, and contributing to discussions. Members should respect others' thinking and value everyone's contributions and follow Chatham House Rules. Summary notes of meetings will be provided by the facilitator and posted publicly.

Composition

The Stakeholder Council is composed of the following organizations and members:

| Stakeholder | Name | Affiliation |
|-------------------------------|------------------|--|
| Commission | Dave Parsons | Chief of Policy & Research |
| Consumer Advocate | Dean Nishina | Executive Director, Division of Consumer Advocacy |
| DBEDT | Carilyn Shon | Hawai'i State Energy Office, Energy Administrator |
| Office of State Planning | Leo Asuncion | Director, Office of Planning |
| Department of Defense | Keith Yamanaka | USAG-HI, Directorate of Public Works |
| Large CI&I Customer | Barry Usagawa | Board of Water Supply |
| Community Delegate (Hawai'i) | Jacqui Hoover | President of Hawai'i Leeward Planning Conference and Executive Director & COO of Hawai'i Island Economic Development Board (HIEDB) |
| Community Delegate (Maui) | Alex de Roode | Founder and lead researcher for High Performance Energy Resilient Communities |
| Community Delegate (Moloka'i) | Barbara Haliniak | Owner, The Business Depot, Inc., and President, Moloka'i Island Foundation |

| Stakeholder | Name | Affiliation |
|------------------------------------|----------------------|---|
| Community Delegate (Lana'i) | Alberta DeJetley | Publisher and Editor of Lana'i Today, Owner, Albert's Farm, member of Lana'i Chamber of Commerce |
| Community Delegate (O'ahu) | Pono Shim | President & CEO at Oahu Economic Development Board |
| Local Government (Hawai'i) | Ron Whitmore | County of Hawai'i Deputy Director, Dept. of R&D |
| Local Government (Maui) | Fred Redell | County of Maui Energy Commissioner |
| Local Government (O'ahu) | Robert "Rocky" Mould | County of Honolulu, Energy Program Manager, Office of Climate Change, Sustainability and Resiliency |
| Sustainability Advocate (Local) | Murray Clay | Ulu pono Initiative |
| Sustainability Advocate (National) | Merrian Borgeson | Natural Resources Defense Council (NRDC) |
| Small Solar & Storage | Chris DeBone | DERC |
| Demand Response | Yvette Maskrey | Honeywell |
| Energy Efficiency | Brian Kealoha | Hawai'i Energy |
| Electric Vehicles | Melissa Miyashiro | Blue Planet Foundation |
| Environmental Advocate | Henry Curtis | Life of the Land |
| IPP (Utility-Scale Resources) | Gerald Sumida | Carlsmith Ball LLP |
| Technical Advisory Panel Chair | Rick Rocheleau | Hawaii Natural Energy Institute (HNEI) |

Status

To date, the Stakeholder Council has met for a kick-off meeting on August 30, 2018. Stakeholder Council members have submitted comments through the IGP proceeding, Docket No. 2018-0165.

A high-level PowerPoint outlining the Workplan was sent to the Stakeholder Council on Friday, November 2, 2018.

A Stakeholder Council meeting was held on November 8, 2018 to provide an overview of the draft IGP Workplan that was being developed. Feedback from this meeting and comments received by November 16, 2018 were incorporated into the final version of the Workplan.

Proposed Schedule

The SC will dedicate at least 14 hours quarterly for in-person meetings, meeting preparations and stakeholder engagement. Meetings will be held four to six times a year aligned to key process milestones.

Shown below in Figure 14, is the proposed meeting schedule with one meeting per quarter through 2021. The specific meeting dates will be agreed upon by the Stakeholder Council.



Figure 14: Stakeholder Council Schedule

5.2 TECHNICAL ADVISORY PANEL

The Technical Advisory Panel is a standing independent industry peer group of experts participating voluntarily from internationally recognized utilities, market operators, and research organizations who have demonstrated engineering expertise in IGP related processes, methodologies, and technologies involving resource, transmission and distribution planning for large scale and distributed renewable resources.

Objectives

The Technical Advisory Panel will provide independent peer assessment, including input and feedback, of the IGP development process, methodologies, tools, and results. TAP meetings foster collegial, balanced discussions in order to achieve greater shared understanding of technical issues to address in IGP for Hawai'i and that may be applicable elsewhere.

Role and Responsibilities

Technical Advisory Panel members will provide relevant knowledge and experience to discuss technical planning related issues and provide guidance on engineering issues and emerging best practices. The expectation is for members to make contributions towards achieving the meeting goals by sharing ideas, asking questions, and contributing to discussions. The Technical Advisory Panel is an independent advisory group, and is not a decision-making body. The TAP will also not produce any engineering and economic analyses or evaluation of sourcing/procurements but may provide feedback on the methods and processes that the Companies use to perform such work. [41, 45]

To clarify in response to comments made by the County of Hawai'i, TAP member participation is strictly voluntary at the discretion and financial support of their organizations for the full duration of the first IGP planning cycle of two years and is not being funded by the Companies. In most cases, this also includes their organizations supporting their travel costs. [44] Those members that may require travel reimbursement for in-person meetings, funding would be provided by HNEI.

A Technical Advisory Panel Chair will be selected on a rotational basis per each two-year IGP planning cycle. The Chair, in coordination with the Companies' Planning Division, will develop meeting agendas to shape discussions, develop meeting summaries, and disseminate information to the other TAP members, the Stakeholder Council, and the public. The TAP Chair is a member of the Stakeholder Council and expected to represent the TAP.

At the request of the TAP members,⁴⁵ meetings are limited to TAP members and invited participants. The meetings will follow Chatham House Rules. Members are expected to

⁴⁵ TAP members considered the request to open the meetings to stakeholders and decided that it would adversely affect the ability of the members to speak openly given the potential for comments to be adversely attributed to their respective organization.

conduct themselves in a way that is respectful to the thought processes of others and to value everyone's contributions.

Composition

The Technical Advisory Panel consists of invited industry leaders in electric power system planning and technology within the U.S. and abroad. The current composition of utility, market operators, and research organizations with relevant expertise and experience was based on stakeholder input and review. The composition of the TAP is provided below.

| Role | Name | Title | Organization |
|-------------|-------------------|--|---|
| Chair | Rick Rocheleau | Executive Director | Hawaii Natural Energy Institute (HNEI) |
| Member | Jeff Smith | Program Manager, Distribution Planning, Operations & Studies | Electric Power Research Institute (EPRI) |
| Member | Elijah Pack | Manager, National Planning | Australia Energy Market Operator (AEMO) |
| Member | Julia Matevosjana | Lead Planning Engineer | Electric Reliability Council of Texas (ERCOT) |
| Member | Anderson Hoke | Senior Electrical Engineer | National Renewable Energy Laboratory (NREL) |
| Member | Jeff Burke | Director, Resource Planning | Arizona Public Service (APS) |
| Participant | Lisa Giang | Director, Advanced Planning | Hawaiian Electric |
| Participant | Paul De Martini | Consultant to Hawaiian Electric | Newport Consulting |
| Participant | John Cole | Senior Policy Manager | Hawaii Natural Energy Institute (HNEI) |
| Participant | Terry Surles | Lead, Clean Energy Solutions | Hawaii Natural Energy Institute (HNEI) |
| Participant | Derek Stenclik | Consultant to HNEI Manager, Power Systems | GE Energy Consulting |

Status and Topics of Focus

The TAP held a kick-off webinar meeting on June 6, 2018 to discuss an overview of the IGP process and the charter for the TAP.

The TAP members attended the public workshop that was held during the morning of September 25, 2018, then held the first in-person TAP meeting in the afternoon of September 25 and all day on September 26, 2018. Topics that were discussed during the TAP meeting included:

1. IGP Process & Critical Planning Issues
2. IGP Stakeholder Engagement
3. Distribution Planning Review
4. Transmission Planning Review
5. Forecasts, Assumptions & Sensitivities
6. IGP Workplan

The TAP held a webinar on November 29, 2018 to discuss the draft IGP Workplan.

Proposed schedule

Technical Advisory Panel meetings will be held periodically, in person and via webinar, aligned to key process milestones. Specific meeting dates are to be agreed upon by the TAP members but proposed schedule with tentative dates is provided below in Figure 15.



Figure 15: Technical Advisory Panel Schedule

5.3 WORKING GROUPS

5.3.1 Forecast Assumptions Working Group

Objectives

The Forecast Assumptions Working Group will provide strategic input and feedback on assumptions and methodologies used for load forecast development and results. The FAWG allows alignment of forecast efforts with experts in forecast methods and subject matter experts for key forecast inputs.

There will be discussions of key forecast components, data sources and major forecast layers. In particular, customer behavior, energy efficiency, distributed energy resources and electrification of transportation, all of which can benefit from panel discussions made up of subject matter experts, who will address industry outlooks and customer perspective, as well as economic and technical considerations. In addition to evaluating behind the meter technologies such as solar PV or electric vehicles by traditional customer classes, discussions surrounding adoption by different market segments and location will be conducted.

The fuel price forecasts are one of the key planning assumptions needed as the Companies move towards 100% renewable energy by 2045. The main objective for the FAWG regarding this topic is to inform stakeholders of the methodology used and obtain feedback in developing the price forecasts of the various liquid fuels used in the existing generating fleet, including renewable biofuels.

Resource costs are one of the key assumptions underpinning the assessment of resource needs. Stakeholders will have the opportunity to review the resource cost assumptions prior to their use in the resource needs planning phase and provide feedback on the resource cost development and resource cost values.

Consistent with the request by DBEDT to update and incorporate customer load studies as well as to include, "Sensitivities for Aggressive Energy Efficiency Targets and Electric Vehicle penetration in 2045," here there will also be discussion of methods to address uncertainties through forecast scenarios and sensitivities such as different target levels of energy efficiency and electric vehicles. [1, 47]

Throughout this process the aim is to foster collegial, balanced discussions to achieve shared understanding of the forecast process and its importance to planning results through iterative discussion and feedback.

Responsibilities

FAWG members are expected to be subject matter experts by providing input, participating in discussion and making recommendations on forecast assumptions, methods and areas of

improvement based on knowledge and facts. The FAWG is an advisory group and not a decision-making body.

Members must be willing to commit to approximately 30-35 hours over the course of 2019 and 5-10 in 2020 as needed to attend meetings and review material. Members should be prepared to contribute to achieving the meeting goals by sharing ideas, asking questions, and contributing to discussions. Members should respect others' thinking and value everyone's contributions and follow Chatham House Rules. Summary notes of meetings will be provided by the facilitator and posted publicly.

Composition

The FAWG will be composed of planners whose areas of expertise span an array of big picture planning from the state, counties and individual island's economic stability and development perspective.⁴⁶ The FAWG will also include a peer group of utility load forecasters with expertise in the methods and models to consider expanding behind the meter choices available to their customers and customer decision economics. The FAWG members will represent the following organizations and communities:

- University of Hawai'i Economic Research Organization
- Department of Business, Economic Development & Tourism
- Representative from the City & County of Honolulu
- Representative from the County of Hawai'i
- Representatives from the County of Maui (3 islands)
- Hawai'i Energy
- EPRI Understanding Electric Utility Customers Group Representative
- Utility load forecasters from the Edison Electric Load Forecasting Group
- Public Utilities Commission Staff
- Division of Consumer Advocacy
- Members of the Companies' forecasting team

To assist the group in discussing assumptions on key components of the forecast, a set of panels will be formed composed of additional subject matter experts in the areas of energy efficiency, distributed energy resources and electrification of transportation that can provide insight from industry, customer participation and program

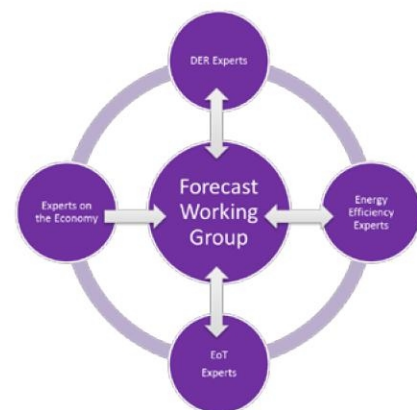


Figure 16: Forecast Assumptions Working Group Outreach

⁴⁶ The Companies received feedback from Stakeholder Council members representing the City & County of Honolulu and the County of Hawai'i suggesting that the FAWG include members to represent the county agencies' perspective.

administration perspectives as well as provide technical and economic considerations. The Companies will also look for opportunities to work with existing groups such as the Hawai'i EEPS Technical Working Group, Edison Electric Institute Load Forecasting Group, EPRI's Understanding Electric Utility Customers Program members and the Companies' existing economic business forum as illustrated in Figure 16.

Status and Proposed Schedule

The FAWG is currently being formed in advance of a January to early February 2019 kick-off meeting. The proposed schedule is provided below in Figure 17. As described above, discussions around the key forecast layers (DER, energy efficiency and EoT) will be conducted with a panel of subject matter experts in the particular topic areas. At the kickoff meeting the FAWG will be consulted on their preference for the number and length of each panel discussion meeting. For example, would they prefer to have full days of discussion and meet less often or opt for shorter but more frequent meetings? A meeting in the July/August timeframe will be held to discuss the assumptions, sensitivities and scenarios before developing the forecast and a meeting in the October timeframe to present the preliminary forecast. The FAWG will present and seek feedback on the assumptions and methods used for developing the forecasts as well as the sensitivities and/or scenarios being considered to the IGP SC at the August 2018 meeting. After the FAWG completes the forecasts, it would be presented to the IGP SC and/or IGP TAP for feedback at the November 2018 meeting before finalizing the forecasts, sensitivities and scenarios.

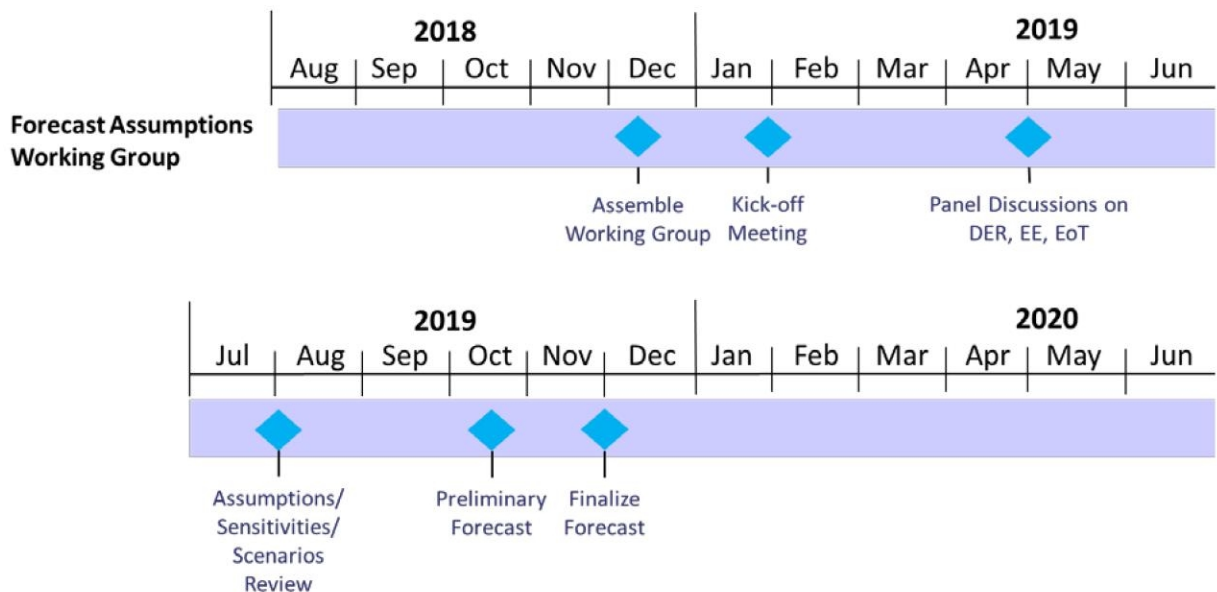


Figure 17: Forecast Assumptions Working Group Schedule

It is expected that the number and specific meeting dates will be agreed upon by the FAWG members and may also depend on any significant changes to major assumptions and their effect on the forecast.

5.3.2 Resilience Working Group

Objectives

The objective of the Resilience Working Group (“RWG”) is to assess and identify electric system resiliency planning criteria for input into IGP. The working group will review existing resiliency planning criteria both for the electric system as well as those for critical infrastructures that are dependent on electricity to function. It is expected that this working group will incorporate state and local considerations and related resiliency planning activities. The working group will synthesize these resiliency needs into IGP planning criteria.

Responsibilities

RWG members are expected to be subject matter experts by providing input, participating in discussion and making recommendations on resilience planning considerations and criteria. The RWG is an advisory group and not a decision-making body.

Members must be willing to commit to approximately 30-35 hours over the course of 2019 and 5-10 hours in 2020 as needed to attend meetings and review material. Members should be prepared to contribute to achieving the meeting goals by sharing ideas, asking questions, and contributing to discussions. Members should respect others’ thinking and value everyone’s contributions and follow Chatham House Rule. Summary notes of meetings will be provided by the facilitator and posted publicly.

Composition

The RWG will be composed of a core group of subject experts on resiliency and emergency services for the state and counties/cities as well as those responsible for critical infrastructure and interfacing with the U.S. Department of Defense. Other stakeholders will be invited to participate in RWG meetings, with guest participation from national resiliency experts also anticipated.

- Members of the Hawaiian Electric Companies
- Public Utilities Commission Staff
- Division of Consumer Advocacy
- Department of Business, Economic Development & Tourism
- Representatives from Hawai‘i, Honolulu, and Maui Counties

Status and Proposed Schedule

The RWG is currently being formed in advance of a late Q1 2019 kick-off meeting. The proposed monthly schedule is provided below in Figure 18 and includes nine meetings, with information to be shared between meetings. It is expected that stakeholder presentations and guest presenters will be invited.

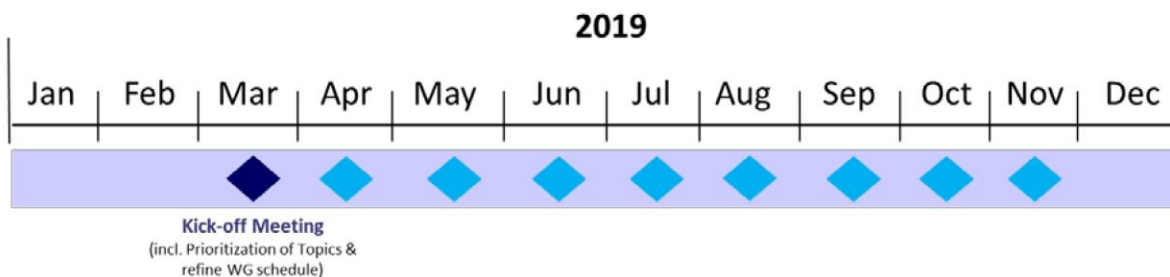


Figure 18: Resilience Working Group Schedule

5.3.3 Distribution Planning Working Group

Objectives

The objectives of the Distribution Planning Working Group (“DPWG”) are to inform and educate stakeholders on various aspects of distribution planning at the Companies, and to afford stakeholders opportunities to collaborate on and co-develop the Companies’ methodologies to identify distribution grid needs. The Companies appreciate and agree with the Hawaii PV Coalition in its comment that, “Our goal is to foster an environment where HECO wants to utilize DERs to their full capabilities to meet system needs, and we are committed to working with HECO to find solutions that facilitate that outcome.” Furthermore, HPVC requests that the distribution planning process “allows for participation from market participants.” [14] The Companies intend for the Distribution Planning Working Group to foster that environment and find solutions that maximize the utilization of DER.

The preliminary scope for the DPWG is:

1. A review and exchange of information of the Companies’ current state of the distribution planning process, and improvements and enhancements the Companies are making.
 - a. Describe the Companies’ current process for capacity expansion of the distribution system, and improvements the Companies are making. Identify potential industry best practices to incorporate. This step will help address the County of Hawaii’s comment which urges the expedited expansion of SLACA analysis to all islands to at least coincide with the first IGP planning cycle. [15]
 - b. Describe the Companies’ current circuit hosting capacity methodology and improvements the Companies are making. Identify potential industry best practices to incorporate.
2. Identify sensitivities and scenarios for DER and load capacity planning analyses to appropriately identify distribution grid needs.
3. Identify non-wires alternatives opportunities and the related information requirements to effectively and efficiently procure and evaluate potential solutions.
4. Integration of distribution with resource and transmission planning.

Market-based issues (e.g., grid services definition, solution sourcing, economic solution evaluation methodologies) will not be part of the DPWG.

Roles and Responsibilities

The role and responsibilities of this Distribution Planning Working Group is to gain a sufficient level of understanding of the Companies' distribution planning and operations, bring forward best planning practices for incorporation into the Companies' processes, collaboratively work with all members of the working group, and to advise the Companies on the distribution planning methodology to identify grid needs.

The Distribution Planning Working Group is not a decision-making body. However, DPWG participants are expected to provide feedback by advising the Companies on best practices on the topics within the scope of the DPWG. The Companies will only be sharing public information in these working group meetings. As recommended by EFCA, the Companies will consider "input and participation from additional utilities that were early movers and have experience planning for and leveraging DERs and microgrids." [42]

Although the DPWG's scope excludes market issues, the outputs of the Distribution Planning Working Group will need to be coordinated with the Market Working Groups, in particular the Grid Services and Evaluation and Optimization sub-working groups. Additionally, outputs of the Forecast Assumption Working Group will impact the bottom-up distribution forecast that will be discussed as part of the DPWG. The TAP will be leveraged as an additional resource of industry experts that can provide a sounding board as needed.

Composition

Consistent with comments from stakeholders, the DPWG will be composed of a diverse set of stakeholders:

- Members of the Hawaiian Electric Companies
- Public Utilities Commission Staff
- Division of Consumer Advocacy
- Department of Business, Economic Development & Tourism
- A Representative from each of the major DER Solution Providers (e.g., Hawaii Energy, Inverter Manufacturer, Solar, Battery Energy Storage)
- Representative of the IPP Developer Community
- Representatives from Hawai'i, Honolulu, and Maui Counties

Working group members are expected to meaningfully participate through the first IGP cycle and attend meetings in-person. The Companies will make the DPWG meetings available to other interested parties through remote webinar or teleconference.

The scope of the DPWG is technical in nature, and therefore DPWG members should have technical knowledge of distribution systems, distribution planning, DER technologies and capabilities, or related knowledge.

Status and Proposed Schedule

The Companies are forming the DPWG in anticipation of a kick-off meeting in January 2019. The proposed schedule below in Figure 19 includes the various topics for discussion based on stakeholder feedback. It is expected that stakeholder presentations and guest presenters will be invited.

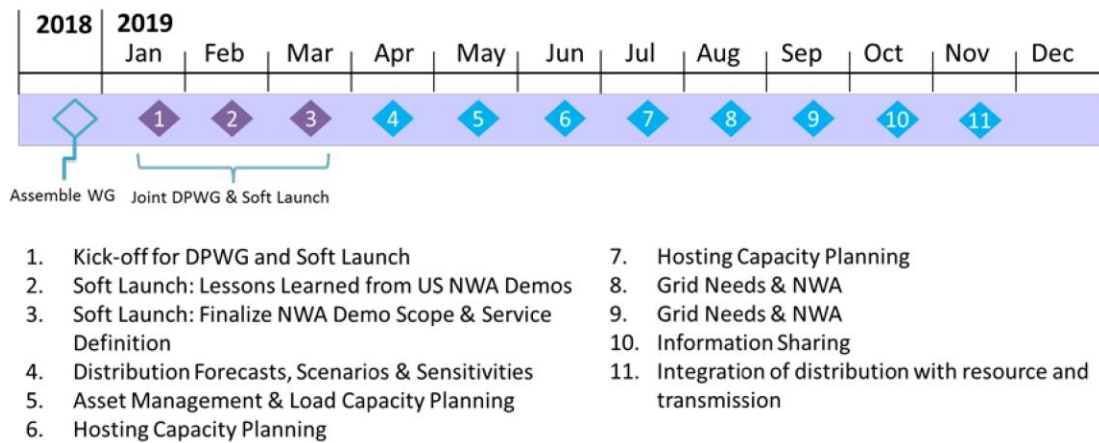


Figure 19: Distribution Planning Working Group Schedule

5.3.4 Market Working Groups

The market working groups are four (4) working groups that will be conducted in a coordinated and sequenced manner to address the major market related topics identified by stakeholders. These topics will include the definition of additional grid services; evaluation and optimization of various solutions; and standardization and streamlining procurement of energy, ancillary services, and transmission and distribution non-wires alternatives. The four market working groups that will be formed and launched in 2019 are:

- Standardized Contract Working Group
- Grid Services Working Group
- Solution Evaluation & Optimization Working Group
- Competitive Procurement Working Group

The charters for each of these working groups follow. The summary schedule of the market working groups is provided in Figure 13 above. Note that the market topics will require concurrent activity to support the Soft Launch in 2019 and IGP Sourcing anticipated to start in

2020. The Companies and facilitators will ensure coordination and effective information sharing among the groups. We expect that the final number and schedule for each of the Market Working Groups' meetings will be informed and agreed to by stakeholders.

5.3.4.I Standardized Contract Working Group

Objectives

The objective of the Standardized Contract Working Group is to determine the optimal approach to contracting for energy, capacity and ancillary services from a variety of sources. In particular, the group will work collaboratively to explore various approaches to enable this procurement. These may include a single contract or multiple contracts (tailored to specific counter-parties). Furthermore, the group will also consider the prospect of a streamlined, simplified contract supported by corresponding, comprehensive market participation rules as compared to loading the market/participation rules into the contract as exhibits or attachments. The working group will explore this as a fundamental question to be followed by an investigation and discussions around more specific aspects of the resulting contract structure. These will include, but not be limited to:

- Participation Rules
- Service Delivery Requirements
- Settlement Terms
- Measurement and Verification (M&V)
- Service Level Agreement (SLA)
- System Integrations and Data Requirements
- Cyber Security
- Contract Duration
- Risk Management
- Liabilities and Securities Obligations

While the contract development is focused on contracting with aggregators and IPPs for the procurement of the aforementioned services, the group will also need to consider additional procurement pathways; in particular, the group also needs to identify the best approach to sourcing these services from an individual customer not represented by an aggregator. Options here might also include a participant agreement as a component of a utility-administered program.

Through several Working Group sessions, the group will examine work done in other jurisdictions to identify best practices to help inform the process. In addition to an examination of other markets, this group will also take a careful look at the Companies' existing Power Purchase Agreements (PPA) and Grid Services Purchase Agreement (GSPA) to identify and take advantage of the efforts already undertaken and to utilize, where possible, elements of these contracts. The Companies have multiple distinct contract forms that

approach this contract solution from different perspectives. On the one hand, the Companies continue to evolve their PPAs⁴⁷ to accommodate more flexible, multi-service procurement. On the other hand, the Companies have initiated grid service procurement for Contingency Reserves, Regulating Reserves and Capacity via distributed, customer assets under a GSPA. Moving forward, the goal is to identify common contractual elements in an effort to uniformly define, to the extent possible, the terms and conditions as well as general delivery and performance requirements.

A standardized contract must also consider the output of the Grid Services Working Group given the range of potential services identified. The resulting grid services definitions⁴⁸ including the delivery/operational requirements are anticipated to be incorporated as an addendum to define the technical performance requirements for the specific solution needed. This approach may allow for a standardized set of terms and conditions and modularity for the application of various grid services.

This group will build upon these efforts in conjunction with a literature review of similar structures for grid services in other jurisdictions to identify common themes and levers, understand relevant and necessary differences and attempt to develop standardized agreement(s) for grid services. Absent of this, the group will carefully build upon each of the current contracts to develop a forward-looking solution with comprehensive market rules.

Roles and Responsibilities

This group will convene to provide insights, share ideas, offer feedback and engage in active and open dialogue around considerations and options for a standard contract vehicle (or vehicles) to be used for the competitive procurement of energy, capacity and ancillary services. This is not meant to suggest that the group will necessarily define the contract structure or that a decision advanced by the Companies needs to achieve a consensus among this group, but rather that this group will inform the process such that a robust, comprehensive approach is taken when rendering the decision on the path forward. The group will be asked to bring observations and learnings from market experience, and provide thoughtful feedback and constructive observations as the Companies assimilate the input received and as the contract vehicle and supporting documentation evolves.

⁴⁷ There are multiple types of PPAs, for example, the Companies' new Renewable Dispatchable PPA is for variable generation with others for firm generation and for scheduled energy.

⁴⁸ The Companies are anticipating leveraging the grid services definitions and templates developed in California with stakeholders as a starting point for the Grid Services WG. The California working group material is available at: <https://drpwg.org/wp-content/uploads/2016/07/CSFWG-Sub-Team-I.-Summary-Conclusions-and-Recommendations.docx>.

Composition⁴⁹

In addition to an outside facilitator and Hawaiian Electric personnel, the Companies propose that the group consist of the following stakeholder representation:

- Distributed Energy Resources Council: Lisa Laughner
- Consumer Advocate Representative: TBD
- Public Utilities Commission Representative: TBD
- Representation on behalf of Utility-scale developers/IPPs: Proposed – Jan Smutny-Jones, Independent Energy Producers Association
- Representation from project finance community (industry group/advocacy group): Proposed – Davis Anderson; formerly of Oracle Capital

The Working Group excludes representation from entities that may participate in the competitive procurement process to avoid the possibility of self-interested elements being inserted into the standardized contract. However, the Companies will hold three stakeholder meetings open to a larger audience. The stakeholder meetings will include all of the Working Group members, but will encourage participation and input from IPPs, aggregators, service providers, financiers, and attorneys representing all the aforementioned.

Status and Proposed Schedule

The proposed schedule in Figure 20 below includes seven working group meetings and three stakeholder meetings. These working group meetings will be facilitated by an independent consultant who will also help by performing literature and market review to support the Companies and inform the stakeholders. Given the breadth of the working group's efforts, it is likely that the March filing will reflect the grid services as currently defined by the Companies as well as market rules applicable to the aggregator/developer as counter-party/supplier. However, the intent will also be to structure and present this contract and associated market rules in an extensible form and format that will evolve to the ultimate standard contract and participation requirements to be used for (ideally) all competitive procurements.

⁴⁹ This list is intended to be illustrative and will be modified as Working Group members are confirmed.

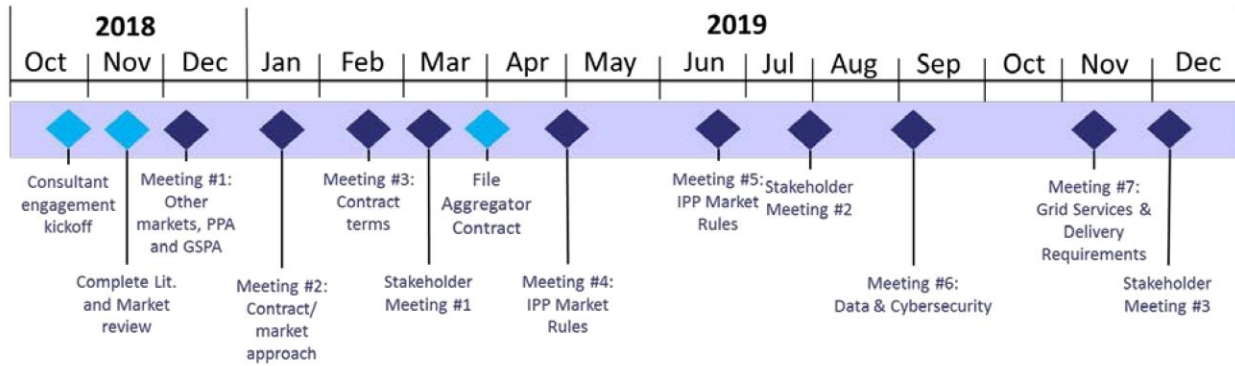


Figure 20: Standardized Contract Working Group Schedule

5.3.4.2 Grid Services Working Group

Objectives

The objective of the Grid Services Working Group (“GSWG”) is to identify and define additional energy, capacity, ancillary and T&D non-wires alternative services (collectively “Grid Services”) in support of IGP Solution Sourcing described in Section 3.3. The GSWG will coordinate and incorporate learnings from planned DER services demonstrations beginning in 2019. The GSWG may also begin to address future services beyond those needed in the 1st IGP cycle. Activity will be prioritized to address services with system needs and stakeholder value, including services for IGP Soft Launch in 2019.

The working group will leverage the efforts of other states and ISOs that have defined relevant services to accelerate development. This may include the following references and guest speakers to share their experiences to-date:

- CA IDER working group
- NY Joint Utilities working groups
- CAISO
- ERCOT

Roles and Responsibilities

The role and responsibilities of the GSWG are to identify and define additional grid services in a technology neutral manner to support IGP sourcing. Participants are expected to provide expertise in the discussion topics as well as potentially relevant examples for consideration and/or lessons learned from other states. The Grid Services Working Group is not a decision-making body. However, the expectation is that it will work collaboratively and provide constructive input and feedback to the Companies within the scope of this working group.

The Companies will only be sharing public information in these working group meetings and will not solicit any confidential information from stakeholders. Discussion of potential resource and DER solutions are outside the scope of the working group. The sole focus is on

the identification, definition and prioritization of additional energy, capacity, ancillary and T&D non-wires alternatives services to support IGP solution sourcing.

Composition

In addition to leveraging the work of the Standardized Contract Working Group, the Companies propose that the GSWG consist of the following stakeholder representation:

- Members of the Hawaiian Electric Companies
- Public Utilities Commission Staff
- Division of Consumer Advocacy
- Representatives from Hawai'i, Honolulu, and Maui Counties
- Department of Business, Economic Development & Tourism
- Hawai'i Energy
- Electric Vehicles
- Developers of small generating resources and energy storage
- Developers of utility-scale generating resources and energy storage:

Status and Proposed Schedule

The Companies are forming the Grid Services Working Group in anticipation of a kick-off meeting in February 2019. The proposed schedule in Figure 21 below includes the various topics for discussion based on stakeholder feedback. It is expected that stakeholder presentations and guest presenters will be invited.

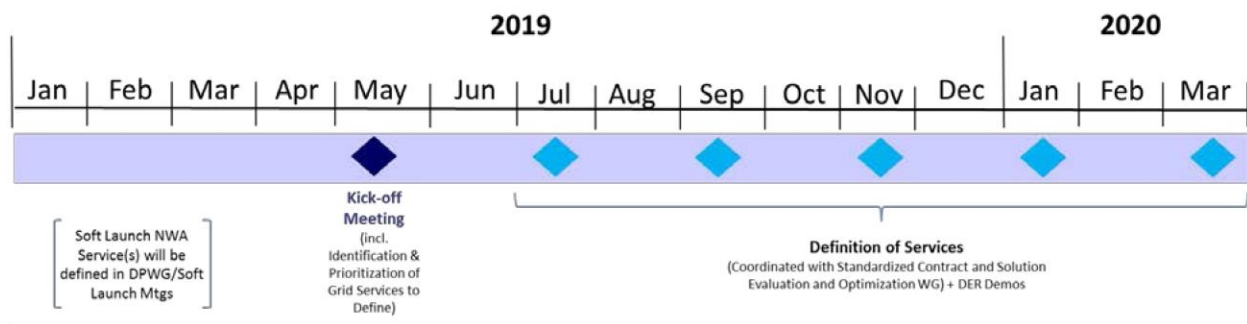


Figure 21: Grid Services Working Group Schedule

5.3.4.3 Solution Evaluation and Optimization Working Group

Objectives

The purpose of the Solution Evaluation and Optimization Working Group is to develop a transparent evaluation and optimization method to fairly assess proposed solutions from the solution sourcing procurement process.

The objectives for this working group are:

- Develop a transparent evaluation method of assessing the technical fit of proposed solutions from the “3Ps” on a comparative apples-to-apples basis. This will require the ability assess combinations of solutions to address an identified need if solutions meeting partial requirements are allowed.
- Develop a transparent optimization method to assess any combined value for proposed solutions that potentially address more than one identified resource/grid need and in relation to other solutions addressing discrete needs identified.
- Discuss how contributions to RPS and reductions in greenhouse gas emissions affect the value of a proposed solution
- Development of methods to be informed by Soft Launch and provide learnings to other Market WG activities.
- Foster collegial, balanced discussion to achieve shared understanding of the competitive procurement process, and to build common ground through iterative discussion and feedback.

Roles and Responsibilities

The role and responsibilities of the SEOWG are to provide input and feedback on the solution evaluation and optimization process and methodology to support IGP sourcing. Participants are expected to provide expertise in the discussion topics as well as potentially relevant examples for consideration and/or lessons learned from other states. The SEOWG is not a decision-making body. However, the expectation is that the working group will work collaboratively and provide constructive input and feedback to the Companies within the scope of this working group. It is anticipated that stakeholder presentations and guest presenters from other states’ efforts will be invited as well as insights and feedback from IGP TAP.

The Companies will only be sharing public information in these working group meetings and will not solicit any confidential information from stakeholders. Discussion of the evaluation of active procurements is outside the scope of the working group. The group’s focus is process and methodology development for evaluation and optimization of IGP focused solutions.

Composition

The Companies propose that the SEOWG consist of the following stakeholder representation:

- Members of the Hawaiian Electric Companies
- Public Utilities Commission Staff
- Division of Consumer Advocacy
- Representatives from Hawai’i, Honolulu, and Maui Counties
- Department of Business, Economic Development & Tourism

Status and Proposed Schedule

The Companies will form the Solution Evaluation and Optimization Working Group in Q1 2019 in anticipation of a kick-off meeting in May 2019. The proposed schedule in Figure 22 below includes some of the topics/milestones for discussion based on stakeholder feedback.

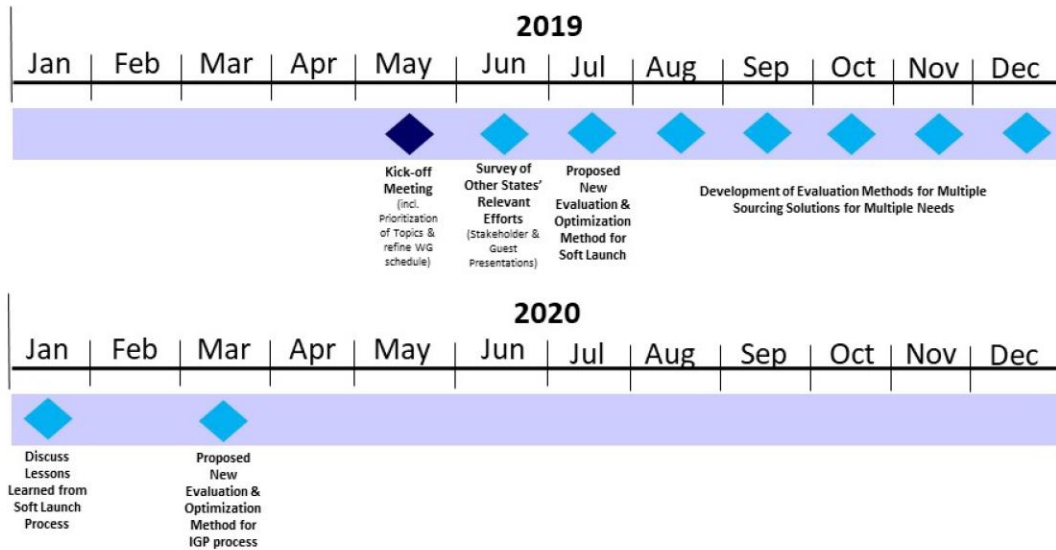


Figure 22: Solution Evaluation and Optimization Working Group Schedule

5.3.4.4 Competitive Procurement Working Group

Objectives

The Competitive Procurement Working Group, in coordination with the Standardized Contract and Grid Services Working Groups, seeks to define the fairest, most efficient and streamlined procurement process possible for the competitive procurement of resources in alignment with the Companies' grid plans as identified through the IGP process. In particular, the working group will seek to provide strategic input and feedback on competitive procurement process development, activities and results, and aspects for improvement. The working group will also consider applicability of the procurements for certain opportunities as noted by HPVC.⁵⁰ [23] To achieve this, the working group plans to first review current procurement practices in Hawai'i and in other jurisdictions. The knowledge gained from this review will inform the development of competitive procurement best practices for application in Hawai'i. Once these best practices are identified and developed, the working group will seek to develop an improved process and accelerated timeframe for procurements that align with broader IGP objectives. As stated elsewhere, the CPWG is not a decision-making body; however, throughout this process, the aim is to foster collegial, balanced discussions to achieve shared

⁵⁰ The concern raised by HPVC [23] will also be addressed in other working groups such as DPWG and GSWG.

understanding of issues to address in IGP and planning results, and to build common ground through iterative discussion and feedback.

Roles and Responsibilities

CPWG members will provide relevant knowledge and experience to discuss competitive procurement related issues and provide guidance on possible resolutions and emerging best practices. The expectation is for members to make contributions towards achieving the meeting goals by sharing ideas, asking questions, and contributing to discussions. Working group members must recognize and agree that the goal of the CPWG is to provide guidance to develop a process that provides for the facilitation of a robust competitive market and is fair to all stakeholders.

Composition

In addition to an outside facilitator and Hawaiian Electric personnel, the group will consist of the following stakeholder representation:

- Consumer Advocate
- Public Utilities Commission Representative
- Representative for developers/IPP
- Representatives from Hawai'i, Honolulu, and Maui Counties
- Department of Business, Economic Development & Tourism

In addition, the Companies will hold multiple stakeholder meetings open to a larger audience. The stakeholder meetings will include a broader audience, such as:

- Consumer Advocate
- Public Utilities Commission
- Distributed energy resources developers
- Utility-scale developers/IPP
- Members of the project finance community

Status and Proposed Schedule

The Companies are currently in the process of negotiating PPAs for projects selected out of utility-scale generation RFPs and will use that competitive procurement process as the starting point for the CPWG discussion. While these most recent RFPs were designed to procure energy in a technology-agnostic way, based on feedback from HPVC, EFCA, COH, and DBEDT, the Companies acknowledge further discussion will be required to develop the procurement process in a way that will facilitate the evaluation of different solutions (utility-scale, distributed, T&D, non-wires, etc.) on an apples-to-apples basis. [48, 49, 50, 51, 52] The current RFPs followed the Framework for Competitive Bidding established in 2008, with modifications approved by the Commission. Based on feedback from the COH, the Companies believe there

are further improvements and refinements that could be made to the competitive bidding process to improve procurements and the results of such procurements. [17, 24] This working group, in conjunction with the larger IGP team, will first need to discuss the sequencing of the overall procurement process and the determination of the identified need and baseline grid infrastructure solution that proposals will be evaluated against. By first discussing the sequencing of the overall procurement process, this shall ensure that the process and results consider all resources on a level playing field, which was a concern expressed by Blue Planet. [26] The identification of the need will shape the methodology for evaluation. This group should also evaluate other methods of procurement in addition to the standard RFP process to see if in selected situations such procurement methods may be more appropriate, for example reserve auctions.

The proposed schedule, as shown in Figure 23 below, includes five stakeholder meetings in 2019. These stakeholder meetings will be facilitated by an independent consultant who will also help by performing literature and market review to support the Companies and inform the stakeholders.

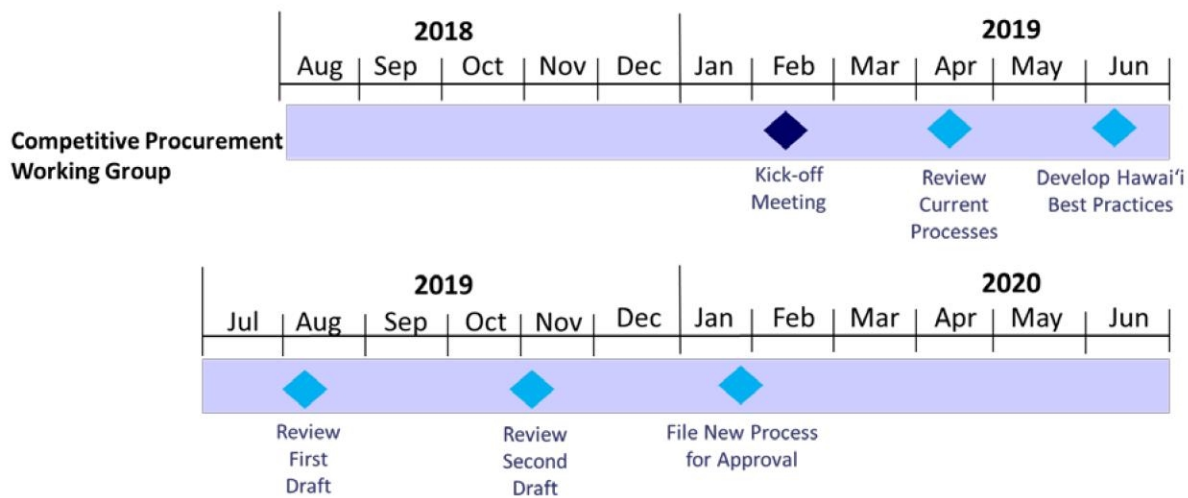


Figure 23: Competitive Procurement Working Group Schedule

Appendix A. Acronyms

To aid in understanding and comprehension, the acronyms used throughout the IGP Workplan are defined below.

| Acronym | Definition |
|---------|--|
| 3Ps | Programs, Pricing, and Procurement |
| AEMO | Australia Energy Market Operator |
| APS | Arizona Public Service |
| BESS | Battery Energy Storage System |
| CA IDER | California Integrated Distributed Energy Resources |
| CAISO | California Independent System Operator |
| CGS | Customer Grid-Supply |
| CGS+ | Customer Grid-Supply Plus |
| CPWG | Competitive Procurement Working Group |
| CSS | Customer Self-Supply |
| DBEDT | Department of Business, Economic Development & Tourism |
| DCA | Division of Consumer Advocacy |
| DER | Distributed Energy Resources |
| DERC | Distributed Energy Resource Council |
| DOD | Department of Defense |
| DP | Distribution Planning |
| DPAG | Distribution Planning Advisory Group |
| DPWG | Distribution Planning Working Group |
| DR | Demand Response |
| DRP | Distribution Resource Planning |
| E3 | Energy and Environmental Economics |
| EE | Energy Efficiency |
| EEPS | Energy Efficiency Portfolio Standards |
| EFCA | Energy Freedom Coalition of America |
| EoT | Electrification of Transportation |

| Acronym | Definition |
|---------|---|
| EPRI | Electric Power Research Institute |
| ERCOT | Electric Reliability Council of Texas |
| EV | Electric Vehicle |
| FAWG | Forecast Assumptions Working Group |
| GE | General Electric |
| GHG | Greenhouse gas |
| GMS | Grid Modernization Strategy |
| GSPA | Grid Service Purchase Agreement |
| HECO | Hawaiian Electric Company |
| HNEI | Hawai'i Natural Energy Institute |
| HPVC | Hawai'i PV Coalition |
| IDER | Integrated Distributed Energy Resources |
| IDSM | Integrated Demand Side Management |
| IGP | Integrated Grid Planning |
| IPP | Independent Power Producer |
| IRP | Integrated Resource Plan |
| IRS | Interconnection Requirements Study |
| LOL | Life of the Land |
| MWG | Market Working Group |
| MI | Michigan |
| MN | Minnesota |
| MVA | Mega Volt-Amps |
| MVAR | Reactive Power |
| MW | Mega Watts |
| Non-IPP | Non-Independent Power Producers |
| NRDC | Natural Resource Defense Council |
| NREL | National Renewable Energy Laboratory |
| NTA | Non-Transmission Alternative |
| NWA | Non-Wires Alternatives |
| NY | New York |
| NY REV | New York Reforming the Energy Vision |
| P95 | Probability for Production 95% |
| PBF | Public Benefit Fund |
| PFR | Primary Frequency Response |
| PG&E | Pacific Gas and Electric |

| Acronym | Definition |
|---------|--|
| PJM | Pennsylvania New Jersey Maryland Interconnection LLC |
| PPA | Power Purchase Agreement |
| PSIP | Power Supply Improvement Plan |
| PUC | Public Utilities Commission |
| PV | Photovoltaic |
| RFI | Request for Information |
| RFO | Request for Offer |
| RFP | Request for Proposals |
| RPS | Renewable Portfolio Standards |
| S360 | Strategies 360 |
| SC | Stakeholder Council |
| SCADA | Supervisory Control and Data Acquisition |
| SCWG | Standardized Contract Working Group |
| SLACA | Substation Load and Capacity Analysis |
| SEOWG | Solution Evaluation and Optimization Working Group |
| T&D | Transmission and Distribution |
| TAP | Technical Advisory Panel |
| TOU | Time-of-Use |
| Tsf | Transformer |
| TWG | Technical Working Group |
| USAG-HI | United States Army Garrison - Hawai'i |
| VoS | Value of Service |
| VT | Vermont |
| WG | Working Group |

Appendix B. Stakeholder Comments

In response to the Commission's Order No. 35569, issued on July 12, 2018 in Docket No. 2018-0165, seven parties representing the interests of the public and local communities in the State of Hawai'i have submitted formal comments in regards to the Companies' Integrated Grid Planning Report by the deadline October 15, 2018. Full versions of the comments submitted may be viewed on the Companies' IGP website: <https://www.hawaiianelectric.com/clean-energy-hawaii/integrated-grid-planning>.

Parties submitting comments included:

1. Blue Planet Foundation (BP)
2. County of Hawai'i (COH)
3. Department of Business, Economic Development, and Tourism (DBEDT)
4. Division of Consumer Advocacy (DCA)
5. Energy Freedom Coalition of America, LLC (EFCA)
6. Hawaii PV Coalition (HPVC)
7. Life of the Land (LOL)

The quotes provided below are referenced in Section II. Summary of Stakeholder and Public Feedback and throughout this Workplan, and are organized by their respective Summary sections. Footnotes within the comments are not replicated below.

IGP Process Scope and Improvements

[1] "DBEDT Requests the Workplan Explicitly Include Sensitivities for Aggressive Energy Efficiency (EE) Targets and Electric Vehicle (EV) Penetration in 2045. ... The growth in energy loads reflected in the PSIP load data in the chart above is influenced by the absence of an energy efficiency target in 2045, as well as Electric Vehicle (EV) adoption assumptions. ... The need for aggressive EE targets for 2045 is highlighted by the fact that the EV penetration incorporated in the PSIP load data is well below what would reasonably be required to achieve a net-zero carbon economy by 2045. DBEDT recognizes that HECO should not be tasked with unilaterally establishing the sensitivities and suggest that they should be identified in the [W]orkplan as a task for the forecast assumptions working group." (DBEDT Comments, Pages 6 - 8, Section D).

[2] "Given that the proposed IGP Process is different than the IRP Process, COUNTY requests that HECO provide a summary of risks and mitigation strategies for the IGP Process, either at the end of each section or for the full report. ... HECO is requested to provide such information and report back to Commission and COUNTY. For example, how will HECO mitigate the challenge of inaccurate net load forecasts for distribution infrastructure and substations? Appendix B, pg. 8 correctly notes this as an issue. Could those forecasts be improved, or can the IGP Process be adapted to accommodate these uncertainties, or can infrastructure be expanded with reasonable-cost "flexibility" to buy-down the risk of an uncertain future?" (COH Comments, Page 14, Section f)

[3] "The IGP Procurement Process Is Not a Substitute for Comprehensive Resource Planning. ... The IGP Report suggests that the planning may proceed from short term to long term: the procurement step will produce a short-term action plan, which "will then be integrated into [t]he long-term pathway."⁵ The IRP Process works in the opposite direction: long-term plans are first developed to inform the formulation of the short-term action plan.⁶ If the short term instead becomes the foundation or driver for planning, this may result in an incrementalist approach that loses focus on the longer-term direction.⁷ In general, more clarity is needed on the relationship between the short and long term planning in the various stages of IGP. (BP Comments, Pages 2 – 6, Section I)

[4] "More clarity is needed on how the planning steps and timeframes in IGP correspond to the steps and timeframes under the IRP Framework, in order to allow an informed comparison of the two processes and their relative advantages and/or challenges. Blue Planet is specifically interested in the extent to which the IGP proposal may effectively reduce the time for the planning process or truncate the planning analysis under the IRP Framework." (BP Comments, Page 6, Section I)

[5] "The independent oversight and stakeholder participation requirements of the IRP Framework are a particularly key feature of the planning process in Hawai'i that should be substantively maintained and not diminished or eliminated." (BP Comments, Page 13, Section III)

[6] "Climate change is undoubt[edly] a major issue to be reckoned with. It is crucial that artificial boundaries not be used to smother lower climate impact choices by higher climate impact choices. Full life cycle analysis is paramount. The IGP regulatory proceeding must explicitly state how it interfaces with necessary greenhouse gas reduction efforts." (LOL Comments, Page 3)

[7] "The State has set aggressive energy policies that need to be addressed in the coming IGP cycle, given the magnitude of the potential impact they could have on system loads in the future. Hawaii passed legislation making it the first state to commit to a zero emissions clean economy and statewide carbon neutrality by 2045. *"The State shall expand strategies and mechanisms to reduce greenhouse gas emissions through the reduction of energy use, adoption of renewable energy, and control of air pollution among all agencies, departments, industries, and sectors, including transportation."*¹⁰ (DBEDT Comments, Page 7, Section D)

[8] “With the State of Hawaii committed to reducing greenhouse gas emissions in alignment with the principles adopted in the Paris Agreement (Act 32, SLH 2017) and committing to achieve a net-zero carbon economy by 2045, it is important that GHG for all scenarios and alternatives be reported. ... The pathway to a net-zero carbon economy and 100% renewable energy in the electric sector will need to optimize the utilization of land to find multi-use solutions for Hawaii’s limited land resources. Reporting on GHG for scenarios and sensitivities supports a holistic review of policy alternatives to inform the legislature, state, and county climate commissions and the Public Utilities Commission.” (DBEDT Comments, Page 9, Section F)

[9] “In addition to the need for the IGP Report to include more details, COUNTY also believes that the following elements should be included in the IGP Process: ... “Value to ratepayers” and “greenhouse gas emissions” should be added to the four principles (to make a total of six) in the Market Working Group analysis.” (COH Comments, Page 18, Section V)

[10] “Relationship between the Performance-Based Regulation docket and the IGP Process. The Hawaiian Electric Companies reference the consideration of certain criteria or performance measures, such as those related to resilience⁸ and the implementation of certain planning actions.⁹ The Consumer Advocate notes that such items, as well as the development of potential metrics around other goals and objectives including but not limited to affordable bills and utility cost control, service reliability, grid planning effectiveness, and the achievement or incorporation of certain policy goals are ongoing topics in Docket No. 2018-0088, Instituting a Proceeding to Investigate Performance Based Regulation. The Consumer Advocate recommends that the IGP Workplan explicitly discuss the relationship between the subject docket and Docket No. 2018-0088, and what should be done to ensure that the two processes are consistent” (DCA Comments, Pages 3 – 4)

[11] “This type of collaborative approach should be accompanied by consideration of how performance-based regulation (“PBR”) can assist in aligning utility incentives with such a planning regime, though given the considerable work necessary to establish a PBR system¹²; PBR should not be a prerequisite to pursuing an evolution in distribution planning.” (HPVC Comments, Page 4 – 5, Section I. A.)

[12] “This proceeding, along with the Distributed Energy Resources (“DER”) (docket no. 2014-0192), and Performance-Based Ratemaking (docket no. 2018-0188) are likely the backbone proceedings for the next decade. How they interact as each advances is key and should be included in the analysis for each proceeding.” (LOL Comments, Page 3)

[13] “Performance Based Regulation is emerging as a fundamental building block for the state’s efforts to meet its far-reaching policy objectives including achieving 100 percent Renewable Energy in a cost-effective manner and could be a key tool in holding down stranded costs, bringing down overall energy bills, and developing the state’s third party energy markets. As such, COUNTY recommends that PBR proposals be integrated and coordinated with the IGP process and that HECO include a proposal for how PBR should be addressed by the various working groups identified in the Report.¹⁵” (COH Comments, Page 12, Section C)

Distribution Planning Process

[14] “For this purpose, we suggest that the Commission establish a review body similar to the California DPAG, which functions as an advisory body to the utilities on distribution planning, and includes an independent engineer and, critically, also allows for participation from market participants.”¹¹ (HPVC Comments, Pages 4 – 5, Section A)

[15] “HECO notes that its SLACA analysis of its distribution systems is currently only conducted on Oahu, and that it plans to extend that to the other islands. COUNTY urges that this expansion to the other islands, including Hawaii Island, be expedited, such that this analysis at least be done to coincide with the first IGP planning cycle.” (COH Comments, Page 15, Section IV)

[16] “HECO states in the Report that, “The new distribution planning process will incorporate new tasks as part of the integrated planning process, in addition to the current annual reviews of distribution system capacity, DER circuit hosting capacity...distribution planning will need to identify the distribution needs to accommodate technologies and resources that are brought by the market. One of the challenges distribution planning will face is the identification of needs for a resource choice like aggregated DER because of the locational impacts of DER.”²³ It is COUNTY’s view that this statement begs the question what kind of transparency will these issues be given by the Company, and it requires elaboration. Who will have access to the new tasks undertaken as well as the information produced by them, and which working groups will address them?”²⁴ (COH Comments, Page 15 – 16, Section IV)

Solution Sourcing and Evaluation

[17] “Additionally, the Report states that market-based solutions are at the heart of HECO’s IGP plan without providing much definition around what is considered a market solution.”¹⁸ Given the importance of market solutions to the overall IGP effort in Hawaii, and given the growing third party energy market in the state, COUNTY believes it appropriate for the Company to spell this out in detail. Indeed, the Report states that, “The success of this re-engineered planning and sourcing process will depend on the establishment of an efficient and competitive marketplace that addresses resource and grid needs that create customer value.”¹⁹ COUNTY agrees that a marketplace for energy services must develop, but COUNTY would suggest that this statement begs the question who will serve as the judge of whether that marketplace has been established? COUNTY believes that the Commission should be involved in making that determination and urges that the Commission’s role be made clear in the Report.” (COH Comments, Pages 13 – 14, Section III. e)

[18] “However, in addition to the identification of procurement requirements for the IGP five year plan, meaningful tasks related to long lead time infrastructure and generation resources will need to be identified and initiated. ... Infrastructure solutions to address barriers to reaching 40% renewable energy [by year 2030 on Oahu] could easily have lead times in excess of a decade. Ensuring that we have initiated the necessary review of what infrastructure will be

required at 40% renewables in this planning cycle will help to identify and initiate investigation into viable infrastructure solutions.” (DBEDT Comments, Pages 8 – 9, Section E)

[19] “The procurement of cost-effective customer-sited energy efficiency resources has a long history of producing net benefits for ratepayers via standardized programmatic regimes such as rebate programs. Likewise, standardized tariffs such as net metering and standard offer contracts for qualifying facilities under PURPA have resulted in the successful deployment of thousands of MW of customer-sited and grid supply renewable energy generation, clearly demonstrating that standardized tariffs are a highly effective deployment mechanism.” (HPVC Comments, Page 7, Section II. B)

[20] “HPVC urges to the Commission and HECO to seek the development of standardized tariffs or programs for the procurement of customer-sited DERs. On a conceptual level, HPVC envisions a standard contract or standard offer tariff, through which a DER customer can be enrolled without requiring bidding, negotiation, or other administrative burdens associated with traditional RFO-based procurement mechanisms. The tariff or contract would contain a set of standardized terms and conditions (e.g. insurance) already approved by the Commission. Other factors could vary based on the nature of the need.” (HPVC Comments, Page 9, Section II. C)

[21] “Along related lines, it is unclear to what extent and how the IGP proposal will go beyond the procurement process and integrate and optimize broader-scale pricing, programs, and tariffs for customer-side resources. These would include an entire range of new and improved time-of-use rates and demand response, DER, and EV programs, in order to fully leverage evolving technologies and customer-side solutions. The IGP process should also maximize cost-effective energy efficiency resources in collaboration with Hawai‘i Energy.³⁵ Such customer-side resources and solutions are not addressed in the procurement process, but must be integrated in the overall planning analysis.” (BP Comments, Page 8 - 9, Section II)

[22] “While the Consumer Advocate recognizes the gains in integrating these processes (as opposed to following a more sequential process), the Consumer Advocate seeks further clarification regarding how the results of resource procurement will be used to inform the overall planning process.” (DCA Comments, Page 4)

[23] “This is concerning given that competitive bidding frameworks have not proven to be an effective mechanism of sourcing DERs. ...While competitive RFOs may be appropriate under some circumstances, e.g. for large-scale projects with long-lead time and slow-developing needs, they are impractical for addressing needs of a smaller magnitude or with shorter timeframes given the level of effort and time required to conduct an RFO, evaluate bids, select projects, and build resource.” (HPVC Comments, Page 6, Section II. A)

[24] “For waivers of the Framework, there must be a “showing” that ratepayers will benefit, whether through decreased costs, increased reliability supply, or general public interest matters. ... The request to waive the CB Framework is lacking in the critical details required by the Framework itself. As such, the Commission should continue to require adherence to the CB

Framework. There should continue to be no discussion of waiver until HECO provides actual evident that the CB Framework is not appropriate at this time, and that evidence should be provided in the request that accompanies this Report.” (COH Comments, Pages 5 – 6, Section II. B)

[25] “In describing its vision for resource acquisition and solution sourcing, the IGP Report would appear to be short on details regarding how much of the new resource development HECO envisions as utility-owned versus IPP. For instance, COUNTY would request additional visibility into what the utility believes is the right proportionality of utility-owned versus IPP-provided generation, and how will that be determined?²³” (COH Comments, Page 15, Section IV)

[26] “In the IGP stakeholder discussions, the HECO Companies indicated that the procurement step would involve two separate rounds of RFPs: the first would determine primarily utility-scale generation resources, and the second would consider T&D and non-wire alternatives. Here, as well, Blue Planet inquires whether such “top-down” ordering may skew the process and results toward centralized, utility-scale resources, rather than considering all resources, including distributed, customer-side solutions, on a level playing field.” (BP Comments, Page 8, Section II)

[27] “In Docket No. 2015-0412, although the Consumer Advocate supported the use of the VoS methodology at that time, the Consumer Advocate also noted that the methodology should not be viewed as a “final” product and “continued analyses and vetting of this methodology, underlying assumptions, and inputs will occur on a going-forward basis.”¹²” (DCA Comments, Page 4)

[28] “The Consumer Advocate would like to take this opportunity to encourage the Commission and the Hawaiian Electric Companies to pursue the “market track” issues and to advance efforts to unbundle the costs of service into relevant, disaggregated detail. These unbundling efforts will be a foundational and integral part of evaluating various alternatives, whether it be supply side, demand response, energy efficiency, transmission, distribution, or any electric service, as part of the IGP process. Relying only on market information to gauge the reasonableness of proposed prices could result in customers paying higher prices on an “ala carte” basis as compared to the price paid for an integrated service. The comparative evaluation that will be conducted in the IGP process should consider all aspects of any service in an “all-in” equal basis¹⁴ to ensure that consumers are receiving the maximum benefits associated with any alternative.” (DCA Comments, Page 5)

[29] “In the IGP Report, HECO calls for the Market Working Group to analyze distribution grid services prior to the commencement of T&D Sourcing and proposes to use four principles in the group’s analysis: ... COUNTY supports these four principles and suggests two additional principles be utilized: Value to Ratepayers, which will allow HECO and the Commission to approve services and solutions that carry the greatest ability to reduce energy costs across the islands and provide maximum value to all customers; and the contribution to the RPS targets and reductions in greenhouse gas emissions.” (COH Comments, Page 16, Section IV)

Information Sharing

[30] "...it is critical that any advisory groups be provided with complete information at all points in the planning process. This includes all relevant planning assumptions, data underlying those assumptions, the details of projects planned in response to system needs, and any parameters or operational requirements that may be established for RFOs or other tariffs and programs." (HPVC Comments, Page 6, Section B)

[31] "Life of the Land looks forward to a healthy discussion of all aspects of the HECO Company plan. Meaningful smart dialogue (two-way discussions with appropriate feedback mechanisms), open and timely access to public data, and early discussion of limited confidential data, will lead to a streamlined process. ... One of the keys to make sure that all entities are aware of what data and what assumptions will be relied upon. It is important to identify these early, and to have a robust discussion around them. Even if all parties do not agree, having the dialogue is important." (LOL Comments, Page 3)

[32] "Specifically, it is critical for HECO to develop the proposal for what, how, when, and to whom information will be shared throughout the IGP Process. ... COUNTY specifically requests that HECO share the types of data inputs and outputs from the process diagram (Figure 3 on page 14) so that COUNTY and other stakeholders can more completely understand the process and provide comments. Appendix B summarizes some of this information in narrative detail, but a chart, table, or bulleted list of data would be helpful in general..." (COH Comments, Pages 6 – 7, Section I. c)

[33] "The Consumer Advocate fully understands and supports the need to keep competitively sensitive information confidential and believes that a further description regarding the proposed use of such information, or information derived from Requests for Information and Requests for Proposals, in the planning process would be useful." (DCA Comments, Page 4)

Stakeholder Engagement

[34] "The Hawaiian Electric Companies describe the proposed Stakeholder Council, Technical Advisory Panel, Working Groups, and plan for customer engagement in Appendix A of the IGP Report. ... The Consumer Advocate believes further description regarding the relationships between these groups, how these groups will communicate and make available information to the Stakeholder Council and in the subject docket, and the role of a potential facilitator in decision-making, would be helpful." (DCA Comments, Page 5)

[35] "First, COUNTY believes that the proposed stakeholder engagement groups lack necessary interplay. Specifically, there appears to be little information sharing contemplated between the Technical Advisory Panel, the Stakeholder Council, and the Working Groups.¹¹ ... Each of the areas covered by the Working groups, ... affect the other, and as a result, COUNTY asserts that either a) the Technical Advisory Panel, Council and Working groups should include cross-pollination from one another to ensure communication and diverse input or b) the Working groups, Council and Technical Panel should have a regularly scheduled meeting or

call, in which the activities of each are made transparent.” (COH Comments, Pages 8 – 9, Section III. a)

[36] “Balanced consumer and community representation. Further description is required to establish how the Hawaiian Electric Companies will actively engage customers and communities to ensure balanced representation. For example, how will the Hawaiian Electric Companies ensure that outreach to consumers and communities has been sufficiently inclusive and diverse, and takes into consideration the preferences and priorities or representative consumers (vs. select consumer groups or communities)?” (DCA Comments, Page 3)

[37] “In noting that ratepayers have become more active in energy dialogues in Hawai‘i and around the nation, what plans do the companies have to involve, educate, and learn from the public during the IGP Process? Appendix A indicates ways to obtain interview data that can be largely driven by the scope and format of questions. COUNTY requests that the companies provide more details on surveys and other measurement instruments indicated on Page 4 of Appendix A.” (COH Comments, Pages 11 – 12, Section III. b)

[38] “COUNTY understand the role and importance of a technical advisor panel, but asserts that the Commission should find some means by which this very crucial panel receives proper input from other stakeholders and working groups.” (COH Comments, Page 9, Section III. a)

[39] “The initial workshop was led by HECO on September 25 for the public to receive answers and to hold a discussion of elements and data to be included in the IGP Workplan, as well as a timeline of next steps for HECO and the public alike. COUNTY suggests that it could be in the public interest to have a follow-up public workshop in 2019 to allow the public to provide input as IGP progresses.” (COH Comments, Page 8, Section II. D)

[40] “Further, can the companies develop a simple, yet illustrative, online forum with basic modeling or illustrations that more directly engages the public in understanding and examining alternatives? That form of engagement would better demonstrate HECO’s commitment to “educate your consumer” and involve ratepayers in a more engaging, exploratory, and bi-directional exchange.” (COH Comments, Page 12, Section III. b)

[41] “COUNTY is also concerned that there is potential for the most important and defining issues to be resolved by the Technical Advisory Panel, sans input from key stakeholders and the public. This should be addressed before the working groups are launched.” (COH Comments, Page 9, Section III. a)

[42] “Similarly, in establishing the Technical Advisory Council, EFCA encourages HECO to solicit input and participation from additional utilities that were early movers and have experience planning for and leveraging DERs and microgrids. Top of mind utilities with this type of experience include Green Mountain Power, which is aggregating customer sited energy storage systems to reduce system level capacity needs and costs, and New York State Electric and Gas Corporation, which is pursuing a number of DER aggregation pilots as part of the state’s Reforming the Energy Vision.” (EFCA Comments, Page 3, Section 2)

[43] "Without providing specific comment on the individuals selected by the Company for the Technical Advisory Panel, COUNTY suggests that the Commission should be involved in the selection of this group or at the very least, HECO should take input from stakeholders on potential membership on the panel." (COH Comments, Page 9, Section III. a)

[44] "The IGP Plan indicates a high amount of workload for the Technical Advisory Panel, at least in relation to other stakeholders, and such work and technical study may require funding to complete. COUNTY requests that HECO indicate how such work will be funded and who the Technical Advisory Panel will specifically represent – HECO, ratepayers, or other. (COH Comments, Page 12, Section III. d)

[45] "Given that future resources and grid services are likely to include new technologies and/or new approaches, how does HECO plan to involve the Technical Advisory Panel in comparing options solicited through the Request for Information and Request for Proposals as mentioned on Appendix B, pg. 5? The capability of the Technology Advisory Panel could be useful to leverage for third-party review of proposals including new technologies and approaches." (COH Comments, Pages 12 - 13, Section III. d)

Working Groups

- Forecast Working Group

[46] "HPVC recommends that the forecast working group be reformulated as an all-encompassing *planning* working group whose review includes all aspects of integrated planning, similar to how the California DPAG is tasked with reviewing utility Grid Needs Assessments ("GNAs"), Distribution Deferral Opportunity Reports ("DDORs"), and the conduct of RFOs." (HPVC Comments, Pages 5 – 6, Section 1. B)

[47] "DBEDT requests that updating customer load studies be specifically incorporated into the IGP Workplan. Integrated grid planning requires customer sited resources. In order to improve forecasts for adoption and effectively design innovative energy efficiency, demand response and distributed energy resources programs updated customer load studies are required. New load studies are an input to assessing the economic incentives that drive customer behavior and provide insight into how, and from whom, electric system costs will be recovered from ratepayers." (DBEDT Comments, Page 6, Section C)

- Market Working Group

[48] "The market working group could be re-designated as a procurement working group that seeks to develop the details of all potential procurement methods.³⁷" (HPVC Comments, Page 6, Section 1. B)

[49] "For example, in the case of the Market Working Group, tasked in the IGP report with identifying proposed changes to the Commission's Framework for Competitive

Bidding in the service of streamlining and standardizing the process to reduce barriers to market participation, EFCA believes that market participants can provide critical input and feedback on the challenges they see.” (EFCA Comments, Page 2, Recommendation 2)

[50] “COUNTY strongly supports the formation of a Market Working Group, but posits that this group’s mission should be more expansive. COUNTY agrees that the competitive procurement process should be examined by the Market Working Group, but this group should also be tasked with identifying all barriers to entry in the market for new energy services.¹³ Among other barriers to the sound development of energy markets in Hawaii that could be explored and identified are utility incentive alignment, access to data and information, grid access and interconnection.” (COH Comments, Page 10, Section III. a)

[51] “By integrating procurement within the IGP, planning and procurement are directly linked, effectively mitigating this concern; however, conducting procurement within the IGP calls for an expedited procurement schedule. DBEDT’s proposal for a Procurement Review Group (PRG), as outlined in DBEDT’s PSIP SOP, supports an expedited procurement schedule. “A PRG will provide greater visibility into what bids were submitted and how quantitative and qualitative metrics were actively applied in the ranking and selection processes.”⁸ (DBEDT Comments, Page 5, Section B)

[52] “HECO indicates in the Report that it intends to form a “select group of non-market participants” to “conduct a comparative evaluation of wires and non-wires alternatives or traditional versus technology-driven alternatives.” This would appear to COUNTY to be an incredibly important assessment, and COUNTY calls for additional information on how this working group relates to the others proposed in the Report, as well as who would comprise the group. Counties should be included on this group.” (COH Comments, Page 16, Section IV)

- Additional Working Groups

[53] “Additionally, COUNTY recommends that an additional Working Group on Customer Equity and Bill Reduction be formed, to focus formally and exclusively on the question of reducing overall energy bills for Hawaii residents and businesses.” (COH Comments, Page 10, Section III. a)

SERVICE LIST
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